Service Manual

LCD Monitor Acer D240H

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Acer D240H Service Manual

Important Safety Notice

1. Safety precautions

This monitor is manufactured and tested on a ground principle that a user's safety comes first. However, improper used or installation may cause damage to the monitor as well as to the user.

Warning:

- This monitor should be operated only at the correct power sources indicated on the label on the rear of the monitor. If you're unsure of the power supply in you residence, consult your local dealer or Power Company.
- Do not try to repair the monitor by yourself, as it contains no user-serviceable parts. This monitor should only be repaired by a qualified technician.
- Do not remove the monitor cabinet. There are high-voltage parts inside that may cause electric shock to human bodies.
- Stop using the monitor if the cabinet is damaged. Have it checked by a service technician.
- Put your monitor only in a lean, cool, dry environment. If it gets wet, unplug the power cable immediately and consult your closed dealer.
- Always unplug the monitor before cleaning it. Clean the cabinet with a clean, dry cloth. Apply non-ammonia based cleaner onto the cloth, not directly onto the class screen.
- Do not place heavy objects on the monitor or power cord.

2. Product safety notice

Many electrical and mechanical parts in this chassis have special safety visual inspections and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Before replacing any of these components read the parts list in this manual carefully. The use of substitute replacement parts, which do not have the same safety characteristics as specified in the parts list, may create shock, fire, or other hazards.

3. Service notes

- When replacing parts or circuit boards, clamp the lead wires around terminals before soldering.
- Keep wires away from high voltage, high temperature components and sharp edges.
- Keep wires in their original position so as to reduce interference.
- Adjustment of this product please refers to the user' manual.

01 Product Specification

1. General:

Acer D240H is designed with LVDS interface and VGA/DVI-D/HDMI input, and Embedded DPF Function ,it featured with embedded universal AC power supplies and audio input. It's a green product and meets all ROHS standard. The power button and display control buttons are on the front of the monitor. The monitors shall automatically to display lower resolution video modes into 1920x1080 full screen display. It can support 720P when DPF Mode,The image can be adjusted through OSD control. It support HDCP and color management function.

1.1 Main Features

Maximum resolution	: 1920(x3) x 1080 @ 60Hz
Back light system	: 4 CCFL (top & bottom edge side)
Pixel pitch	: 276.75 um (H) x 276.75 um (V)
Display area	: 531.36mm (H) x 298.89mm (V)
Brightness	: 300cd/m² (TYP.)
Contrast ratio	: 1000:1 (TYP.)
DCR	:80000:1 (Max)
Response time (Tr+Tf)	: 5ms (TYP. ON/OFF) 2ms (Gray to Gray)
Viewing angle	: 170° (H)/ 160°(V), (TYP.)
Input interface	: Analog (D-sub 15 pin) Digital Option (DVI-D 24 pin & HDMI 19Pin)
Power management	: Compatible with VESA DPMS
Plug & Play	: VESA DDCCI
OSD language	: English, French, Spanish, Italian, Deutsch, Simplified Chinese, Traditional Chinese, Japanese (Dutch, Finnish, Russian depend on sale region)

Universal AC power supply

1.2 Accessories

AC Power Cord	: 1.8 m. (Black. Cord type depend on sale region)
VGA cable	: 1.8 m. (15 pin D-SUB, black cable with blue male connector)
User manual	: English (640Mb CD)
Warranty card	:
DVI cable (option)	: 1.8 m. (18+1 pin, black cable with white connector)
HDMI cable (option)	: 1.8 m. (19 pin, black cable with white connector)

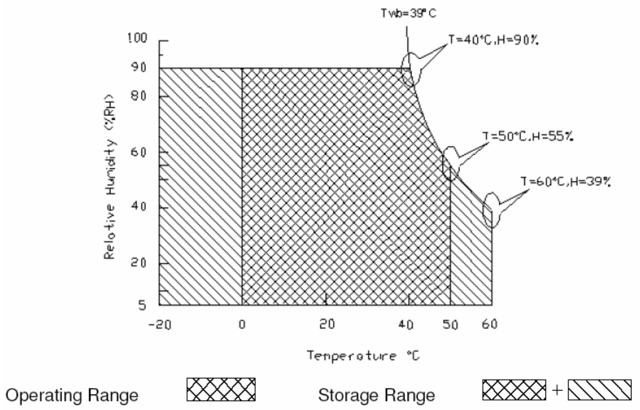
USB: USB2.0 (optional function)
Webcam: 1.0M resolution(1280 x 800), standard USB2.0 interface, array microphone (optional function)

2. Operation Specifications

The unit should suffer no visible cosmetic damage and should operate with no degradation in display quality during exposure to the operating conditions and after exposure to the non-operating conditions, in any sequence.

2.1 Environmental conditions

Operating	Specification
Temperature range	0°C to 50°C
Relative humidity	5% to 90%
Altitude	0 to 3048M (10000 ft)
Storage	
Temperature range	-20°C to 60°C
Relative humidity	5% to 90% (not condense)
Altitude	0 to 9144M (30000 ft)



2.2 Safety, EMC, Ergonomics and Compatibility Requirements

Items	Description						
Safety	UL/c	CB	TUV/G	CCC			Other
	●	●	●	●			
EMC	FCC	CE	CCC	VCCI-B			
	●	●	●	●			
Ergonomics	TCO	TCO03					
	●	●					
Compatibility	Windows		Windows 2000		Windows		Windows
	●		●		●		●
Power Management	Energy Star						
	●						

2.3 Electrostatic Discharge Requirements

Item	Condition	Spec	
Electrostatic Discharge	IEC61000-4-2(EN55024)	Contact discharge: 4KV	
		Contact discharge: 8KV	●
		Air discharge : 8KV	
		Air discharge : 15KV	●

Reliability

Items	Condition	Spec	Note
MTBF	T=25℃	>50,000 Hours,	
CCFL Life time	Luminance becomes 50%	50,000 Hours(Typ)	Note1

Note1. Display an all WHITE field at mid Brightness and Contrast settings.

3. Electrical and Optical Characteristics and Performance

3.1 Main Power Supply

3.1.1 Input characteristics

Items	Condition	Spec	Note
AC Input Voltage range	Universal input full range	90~264Vac	
AC Input Voltage rating	Universal input full range	100~240Vac	
AC input frequency range	90~264Vac	47~63Hz	
AC input frequency rating	100~240Vac	50~60Hz	
AC Input Current	100Vac	2.0A(max)	
	240Vac	0.8A(max)	
Inrush Current	115Vac,cold star,25°C	35A (max)	See Note2
	230Vac,cold star,25°C	70A(max)	
AC-DC power Efficiency	DC output full loading	≥79%	

Note2. Before each test, the buck capacitor need to be discharged.
Before each test, it must be 10 minutes at least after the latest test.
Hot star not component be damaged.

3.1.2 Output characteristics

Items	Condition	Spec	Note
Ripple and Noise	+25V output	<800mv	With system See note 3
	+5V output USB +5V output: Audio +5V output:	<500mv <150mv <500mv	
	+25V output	<480mv	With dummy Load
	+5V output USB +5V output: Audio +5V output:	<100mv <100mv <100mv	
DC Output Voltage	25V loading:0.3A~1.4A 5V loading:0.75A~1.5A Audio 5V: 0A~1.2A USB 5V: 0A~1.5A	Vcc25V:23.2V~28V Vcc5V: 4.75V~5.25V Audio 5V: 4.95V~5.45V USB 5V: 4.75V~5.25V	For system active
	25v loading:0.1A~1.5A 5V loading: 0A	Vcc25V: 23.2V~30V Vcc5V: 4.75V~5.25V	For power saving or DC off

DC output loading capability		Vcc5V/1.8A, Vcc25V/1.4A Audio 5V: 1.5A USB 5V: 1.5A	
Rise Time		<50mS	
Dynamic load change			
Hold-up time	AC input: 100V~240V	>10mS	
Overshoot		<10%	
Turn on delay time		2S	
Power management			See Table-1

Note3: Paralleled a 0.1uF ceramic Cap. And 47uF aluminum Cap. Between the end of DC loading side, Measured band-width=20MHz. Ripple voltage of +25V is less than 1500mv when enter into burst mode.

3.1.3 Protection characteristics

Protection	Condition	Spec
OPP(Over current protection)	nominal AC input	90W (min)
SCP(short circuit protection)	with auto-recovery function	
OVP(Over voltage protection)	Auto recovery	<output capacitor voltage
OTP(Over temperature protection)	NA	
Fuse protection	NA	

Table-1

Status	H-sync	V-sync	Video	Power	LED
Power On	on	on	active	≤ 70W	White
Power Saving	off	on	blanked	< 2W	Amber
	on	off	blanked	< 2W	Amber
	off	off	blanked	< 2W	Amber
Power Off	--	--	--	< 1W	Off

3.2 Backlight Power Supply

Panel: AUO-M240HW01-V2

Items	Specification
Lamp	4 CCFL
Input Voltage	23.2---28V
Input current	1.2A (Typ.), 1.4A (Max.)
On/Off switch level	3.6V≧V on≧ 2.0 V (on) -0.3v ≤ V off ≤ 0.8 V (off)
On/Off switch level	3.6V≧V on≧ 2.0 V (on) -0.3v ≤ V off ≤ 0.8 V (off)
Brightness PWM Duty (ACM Off)	35%~100%
Brightness PWM Duty (ACM On)	3%~100%
CCFL operating Voltage	900Vrms (Typ.),
CCFL Current	
	7.5mA (Typ.)
	8.0mA (Max.)

CCFL startup voltage	≧2000 Vrms (0˚C)
CCFL startup voltage	≧1850 Vrms (25˚C)
Operating frequency	40~60 KHz
Protect delay time	> 1 second
Efficiency	≥75%

Note: Other panels please refer to the reference panel specs**.**

Brightness output

The test to verify specifications in this section shall be performed under the following standard conditions unless otherwise noted.

Temperature	: 25 ± 5°C
Test pattern	: white
Video Resolution	: 1920 x 1080
Video input level	: 700 mV ± 2%
Warm-up time	: 30 minutes

Set brightness control and also contrast control at maximum, to measure the screen center, the light output shall BL ≥ 240 cd/m^2 **.**

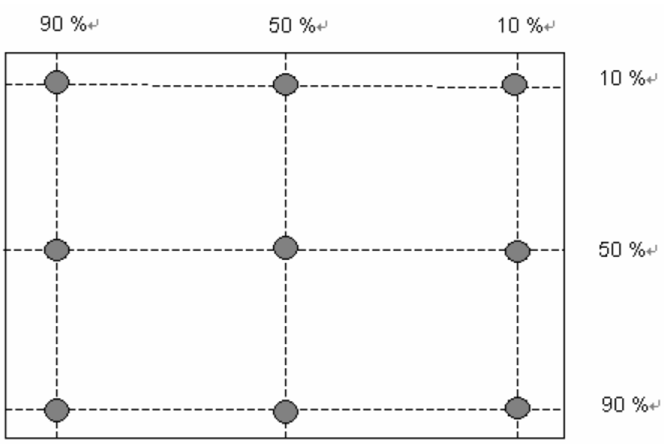
3.3 White balance

The test standard conditions refer to Sec 3.3. (Brightness and contrast are under default value)

Mode		**Chromaticity Coordinate**	
		x	**y**
Cool	9300K	0.283 ± 0.030	0.297 ± 0.030
Warm	6500K	0.313 ± 0.030	0.329 ± 0.030
User		Panel While x	Panel While y

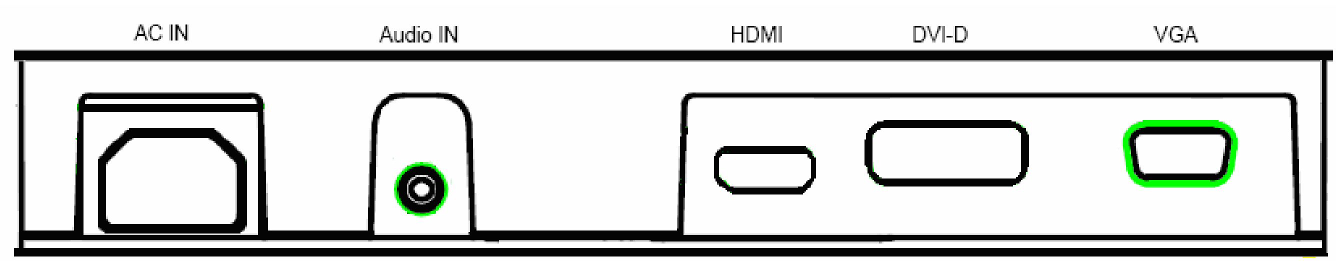
3.4 Brightness uniformity

The test standard conditions refer to Sec 3.3.



$$\frac{\text{Min. luminance of nine points (backlight)}}{\text{Max. luminance of nine points (backlight)}} \geq 75\%$$

4. Input / Output Signal Specifications



4.1 AC in

4.1.1 AC Input Voltage: 100~240VAC

4.1.2 AC Input Current: 1.2A @100Vac, 0.6A @240Vac

4.1.3 AC Frequency Range: 50~60Hz

4.2 Audio in

4.2.1 Input impedance ： ≧ 10K ohm

4.2.2 Frequency response range ： 200Hz ~ 10kHz

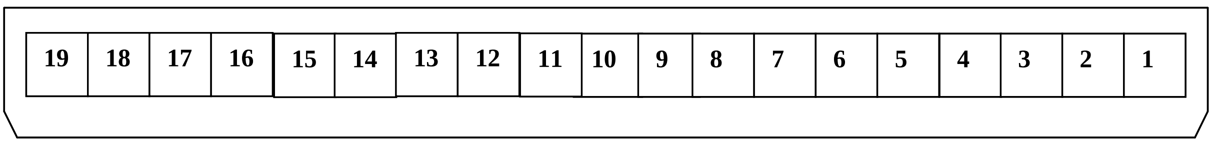
4.3 USB in (Option)

The USB 2.0 includes 4 pins;

pin1:VBUS; pin2:DM; pin3:DP; pin4:GND

4.4 HDMI in

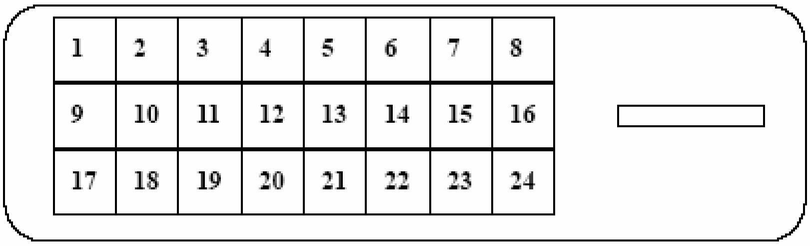
HDMI type A Connector Pin assignment:



Pin	Symbol	Pin	Symbol
1	TMDS Data2+	11	TMDS Clock shield
2	TMDS Data2 shield	12	TMDS Clock-
3	TMDS Data2-	13	CEC
4	TMDS Data1+	14	No connect
5	TMDS Data1 shield	15	SCL
6	TMDS Data1-	16	SDA
7	TMDS Data0+	17	DDC/CEC Ground
8	TMDS Data0 shield	18	+5V Power
9	TMDS Data0-	19	Hot Plug Detect
10	TMDS Clock+		

4.5 DVI-D in

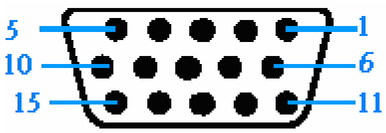
DVI-D Connector Pin assignment:



Pin	Symbol	Pin	Symbol
1	TMDS Data 2-	16	Hot Plug Detect
2	TMDS Data 2+	17	TMDS Data 0-
3	TMDS Data 2/4 shield	18	TMDS Data 0+
4		19	TMDS Data 0/5 shield
5		20	
6	DDC Clock	21	
7	DDC Data	22	Clock shield
8	Analog Vertical Sync	23	Clock +
9	TMDS Data 1-	24	Clock -
10	TMDS Data 1+		
11	TMDS Data 1/3 shield		
12			
13			
14	+5V Power		
15	GND		

4.6 VGA in

4.6.1 D-sub Connector Pin assignment:



Pin	Symbol
1	Red Video
2	Green Video
3	Blue Video
4	N/C
5	Ground
6	Red Ground
7	Green Ground
8	Blue Ground
9	PC +3.3/+5V
10	Sync. Ground
11	N/C
12	DDC SDA
13	H sync
14	V sync

15	DDC SCL

4.6.2 Signal SPEC:

Items	Condition	Specification
Analog RGB signal	Input impedance =75 Ohm	0.7Vp-p
Sync	Input impedance ≧1k Ohm	TTL level, Separate H/V-sync(+/-)
H-Sync Frequency		31K~83KHz
V-Sync Frequency		49~76Hz

4.7 Timing table

VESA MODES						
Mode	Resolution	Horizontal		Vertical		Nominal Pixel Clock (MHz)
		Nominal Frequency +/-0.5KHz	Sync Polarity	Nominal Frequency +/-1Hz	Sync Polarity	
VGA	640*480@60Hz	31.469	N	59.941	N	25.175
	640*480@72Hz	37.861	N	72.809	N	31.5
	640*480@75Hz	37.5	N	75	N	31.5
SVGA	800*600@56Hz	35.156	P	56.25	P	36
	800*600@60Hz	37.879	P	60.317	P	40
	800*600@72Hz	48.077	P	72.188	P	50
	800*600@75Hz	46.875	P	75	P	49.5
XGA	1024*768@60Hz	48.363	N	60.004	N	65
	1024*768@70Hz	56.476	N	70.069	N	75
	1024*768@75Hz	60.023	P	75.029	P	78.75
	1152*864@75Hz	67.5	P	75	P	108
	1280*960@60Hz	60	P	60	P	108
	1280*720@60Hz	44.955	P	59.94	P	74.176
SXGA	1280*1024@60Hz	63.981	P	60.02	P	108
	1280*1024@75Hz	79.976	P	75.025	P	135
WXGA	1360*768@60Hz	47.712	P	60.015	P	85.5
WXGA+	1440*900@60Hz	55.935	N	59.89	P	106.5
	1440*900@75Hz	70.635	N	74.984	P	136.75
WSXGA+	1680*1050@60Hz	65.29	N	59.954	P	146.25
	1680*1050@75Hz (VGA Only)	82.306	N	74.89	P	187.00
UXGA	1600*1200@60Hz	75	P	60	P	162
	1920*1080(Red)@60Hz	66.587	P	59.93	N	138.5
	1920*1080@60Hz (VGA Only)	67.158	N	59.96	P	173
IBM MODES						
	720x400@70Hz	31.469	N	70.087	P	28.322
MAC MODES						
VGA	640*480@66.7Hz	35	P	66.667	N	30.24

SVGA	832*624@75Hz	49.725	N	74.55	N	57.283
XGA	1152*870@75Hz	68.681	N	75.062	N	100
Other MODES						
WXGA	1280*800@60Hz	49.702	N	59.81	P	83.5

Note: 1. Non-interlace signals only (An interlace signal cannot be display)

2. Please refer to F/W specification for more detail

3. Each frequency of Power Macintosh and Sun Ultra is a reference value

4.8 HDMI timing table

For DVD Player Input, Attached timing is supported :

Mode	Resolution	Pixel Clock MHz	H sync KHz	V sync Hz	Ratio
VGA	640 x 480p	25.2	31.5	60	4:3
NTSC (480i)	720 x 480	13.50	15.73	60	4:3
NTSC (480p)	720 x 480	27.00	31.47	60	4:3
PAL (576i)	720 x 576	13.50	15.63	50	4:3
PAL (576p)	720 x 576	27.00	31.27	50	16:9/4:3
720p	1280 x 720	74.25	37.5	50	16:9
720p	1280 x 720	74.25	45	60	16:9
1080i	1920 x 1080	74.25	28.125	50	16:9
1080i	1920 x 1080	74.25	33.72	60	16:9
1080P	1920 x 1080	148.50	56.250	50	16:9
1080P	1920 x 1080	148.50	67.50	60	16:9

4.9 Audio output SPEC

Items	Specification			TEST CONDITIONS
	Min	TYP	MAX	
Output power (W)	1.6	2.0	2.4	THD+N = 10%(AT 1KHz 1Vrms)
Output impedance (Ω)	3.4	4	4.6	AT 1KHz 1Vrms
Total harmonic distortion plus noise	---	---	10%	Po≦ 2.0W(at 1KHz 1Vrms, 200HZ <f<10KHZ)
Signal to noise ratio (dB)	40	---	---	THD+N≦ 5%
PWM frequency (KHz)	200	250	300	

Note: The low pass RC Filter (R=100Ω / C=0.047uF) for Class-D Output Power and THD+N Measurement

4.10 DDC data

EDID File Format : VESA's EDID Standard Version #3, Revision #0,

EDID Structure : Version #1, Revision #3.

EDID Data Table : See the attached table (for example)

4.10.1 VGA EDID table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	04	72	74	00	00	00	00	00
1	00	00	01	03	68	35	1D	78	EA	60	85	A6	56	4A	9C	25
2	12	50	54	AF	CF	00	81	80	71	4F	95	00	95	0F	A9	40
3	B3	00	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
4	35	00	13	2A	21	00	00	1A	00	00	00	FC	00	44	32	34
5	30	48	0A	20	20	20	20	20	20	20	00	00	00	FD	00	38
6	4C	1F	53	12	00	0A	20	20	20	20	20	20	00	00	00	FF
7	00	30	30	30	30	30	30	30	30	30	30	30	30	0A	00	CS

4.10.2 DVI EDID table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	04	72	74	00	00	00	00	00
1	00	00	01	03	80	35	1D	78	EA	60	85	A6	56	4A	9C	25
2	12	50	54	AF	CF	00	81	80	71	4F	95	00	95	0F	A9	40
3	B3	00	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
4	35	00	13	2A	21	00	00	1A	00	00	00	FC	00	44	32	34
5	30	48	0A	20	20	20	20	20	20	20	00	00	00	FD	00	38
6	4C	1F	53	12	00	0A	20	20	20	20	20	20	00	00	00	FF
7	00	30	30	30	30	30	30	30	30	30	30	30	30	0A	00	CS

4.10.3HDMI EDID table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	04	72	74	00	00	00	00	00
1	00	00	01	03	80	35	1D	78	EA	60	85	A6	56	4A	9C	25
2	12	50	54	AF	CF	00	81	80	71	4F	95	00	95	0F	A9	40
3	B3	00	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
4	35	00	13	2A	21	00	00	1A	00	00	00	FC	00	44	32	34
5	30	48	0A	20	20	20	20	20	20	20	00	00	00	FD	00	38
6	4C	1F	53	12	00	0A	20	20	20	20	20	20	00	00	00	FF
7	00	30	30	30	30	30	30	30	30	30	30	30	30	0A	01	95
0	02	03	22	F2	23	09	7F	07	4E	01	02	03	84	05	06	07
1	10	11	12	15	93	1F	14	83	01	00	00	66	03	0C	00	10
2	00	10	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00	06	23
3	21	00	00	18	01	1D	00	72	51	D0	1E	20	6E	28	55	00
4	06	23	21	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C
5	25	00	06	23	21	00	00	9E	01	1D	00	BC	52	D0	1E	20
6	B8	28	55	40	06	23	21	00	00	1E	01	1D	80	D0	72	1C
7	16	20	10	2C	25	80	06	23	21	00	00	9E	00	00	00	CS

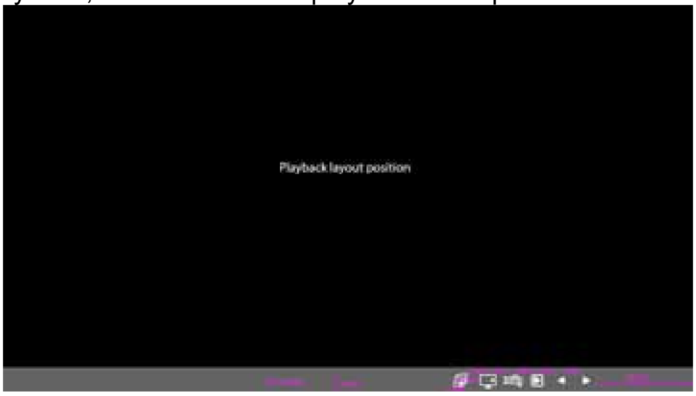
4.11 DPF function

D240H supports DPF Function, which Embeded 2G Nandflash stroage ,it can also communication with PC by connecting USB cable,and supports 4 IN 1 memory card which includes SD, XD, MS, and MMC, besides the 4 kind's memory card,it also supports the adaptor card: Mini SD, MicroSD, MS Pro,MS,Duo, MS Pro Duo, RS MMC, MMC Plus, RS MMC,and supports CF card slot include CFI, CF II,MD memory card.User can easily switch to different functions though OSD Menue.

4.11.1.DPF function introduce

1) Nand play photo function:

1. without any memory card, the screen will display slideshow photo from Nand storage,



2. If no photo files in Nand storage,the screen will display browser mode.

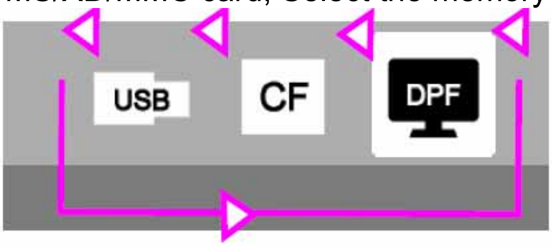


2) card reader function

Connect the USB upstream and the card read function will be started when D240H on Monitor mode..PC will find the two USB devices are CF card and SD/MS/XD/MMC card, the two devices that in the DPF all can be operation by PC

4.11.2. Memory card test

1, Insert SD/MS/XD/MMC card, Select the memory on input source menu



2, Play photo ,the performance should be no color shift, the other function such as Rotate,effect ,slideshow, next, forward, pause also should be passed.

Notes:

1. SD card family include mini SD, mobile SD,MMC memory card include RS MMC, RS MMC Plus, RS MMC mobile.
2. MS card slot also support MS Pro, MS Duo, MS Pro Duo,
3. CF card slot support CFI,CF II and MD(Micro Drive) card.

4.11.3. Support format test

The D240H only support photo format as below. please check and confirm.

4.11.4. DPF function test

4.11.4.1. keypad control

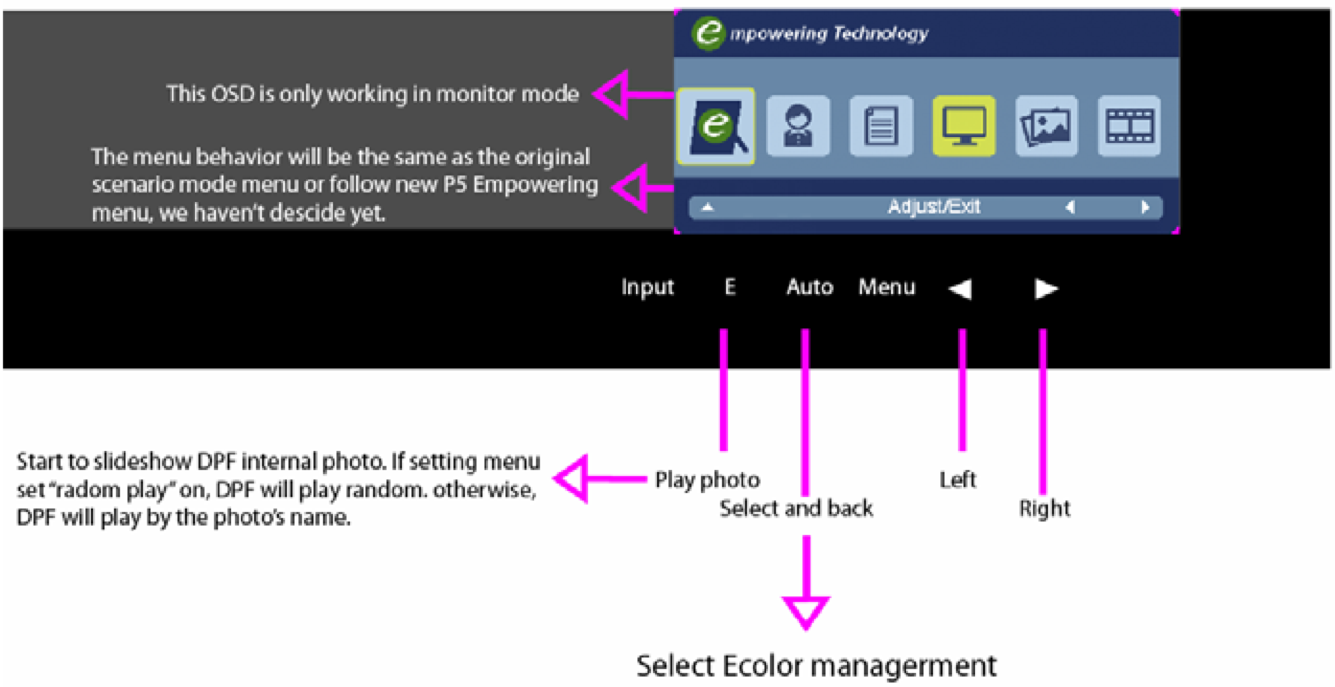
1. Switch keypad flow

Category	ext	Yes/ No
Photo	.jpg	
	.bmp	

DPF Monitor flow to DPF

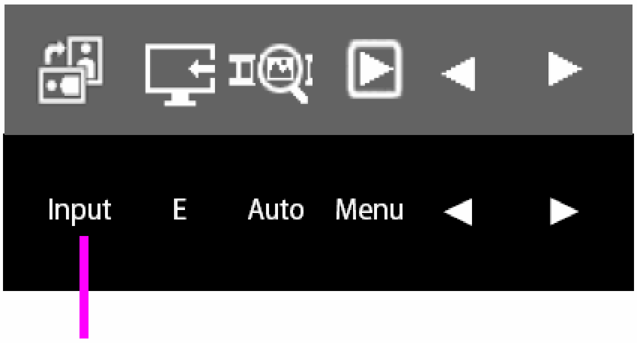
Switch to DPF Mode	Layer 1	Layer 2
Input	detect input source	no function
Empowering	open empowering menu	switch to DPF
Auto	auto	auto and select ecolor manger
Menu	main menu	
Left	base on acer h series spec	left
Right	base on acer h series spec	right

After Empowering menu pop up, Ekey will be "inter DPF", "Auto" will be select ecolor management.



2. DPF play photo mode keypad flow

DPF/Play Back	Layer 1
Input	rotate photo "clock wise"
Empowering	switch to Monitor
Auto	change to select Photo Browser
Menu	play/stop
Left	previous
Right	next



Everytime user click input button , the photo which shows on the screen will rotate 90 degrees to clockwise direction.



If DPF is on slideshow, user can not rotate photo, DPF indecator will also not show "rotate" icon.

3. DPF select photo mode flow

DPF / Photo Browser	Layer 1
Input	select different source
Empowering	switch to Monitor
Auto	change to setting menu
Menu	select photo/ change page
Left	previous/previous page
Right	next /next page

4. DPF setting menu flow

DPF / Setting menu	Layer 1	Layer 2	Layer 3
Input	no function	no function	no function
Empowering	switch to Monitor	switch to Monitor	switch to Monitor
Auto	switch to play back	Last/Layer 1	Last/Layer 2
Menu	select minor function	select minor function	Next/Play photo
Left	left	up	Adjust/Last
Right	right	down	Adjust/Next

Setting menu	Layer 1	Layer 2	Default
Slideshow	Time	5 second	5 second
		30 second	
		60 second	
		5 minutes	
	Slideshow effect	random	random
		淡入淡出	
		磚塊	
		垂直交錯	
		左右開合	
DPF Setting	Auto sleep	Off	Off
		1 Hour	
		2 Hour	
		5 Hour	
	Reset	Start	
	Random play	On	Off
		Off	
	Copy all	Start	
	Delete all files?	Start	
	Background color	灰	灰
		綠	
		紫紅	
		藍	
		棕	
	Language	Fallow Monitor SPEC	English

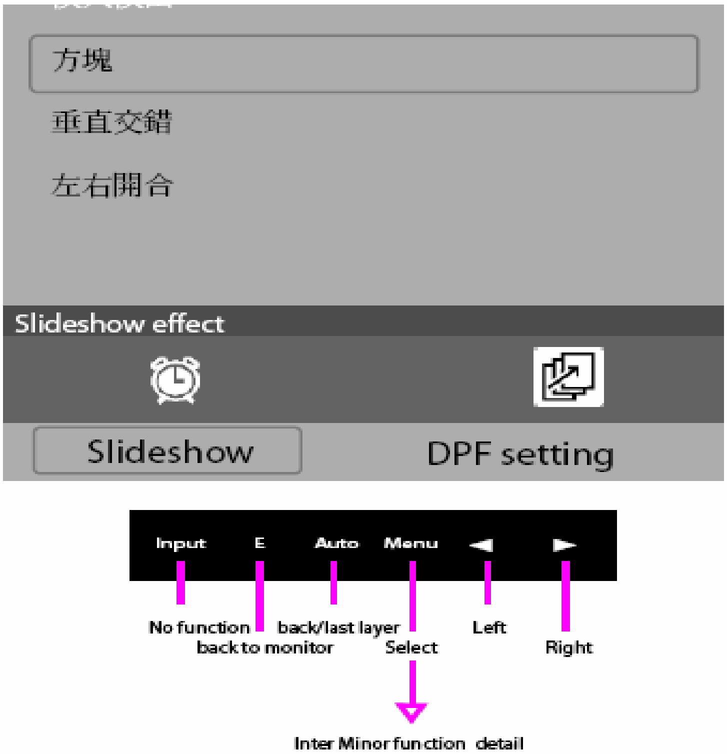
Please not program this function on this stage

Fade in Fade out
Block 2
Blind Vertical
BarLR Spread

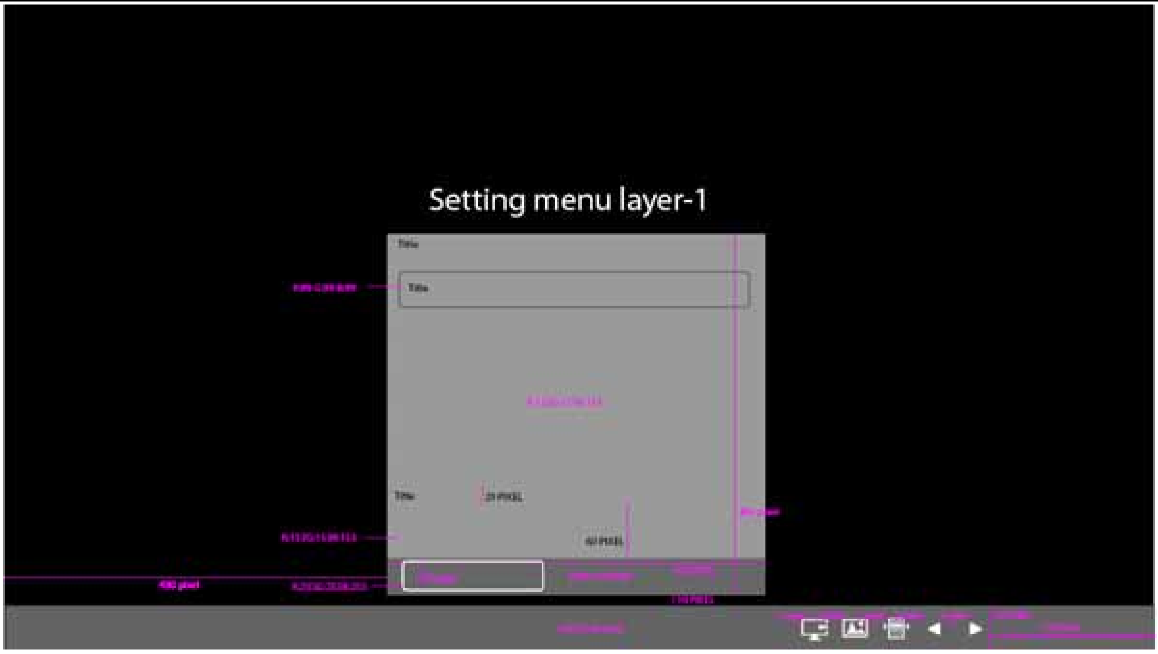
The AVI slideshow effect files name that acer choise.

- Copy files function can not been select while user use DPF memory.
  Delete all can not been select while user not use DPF memory.

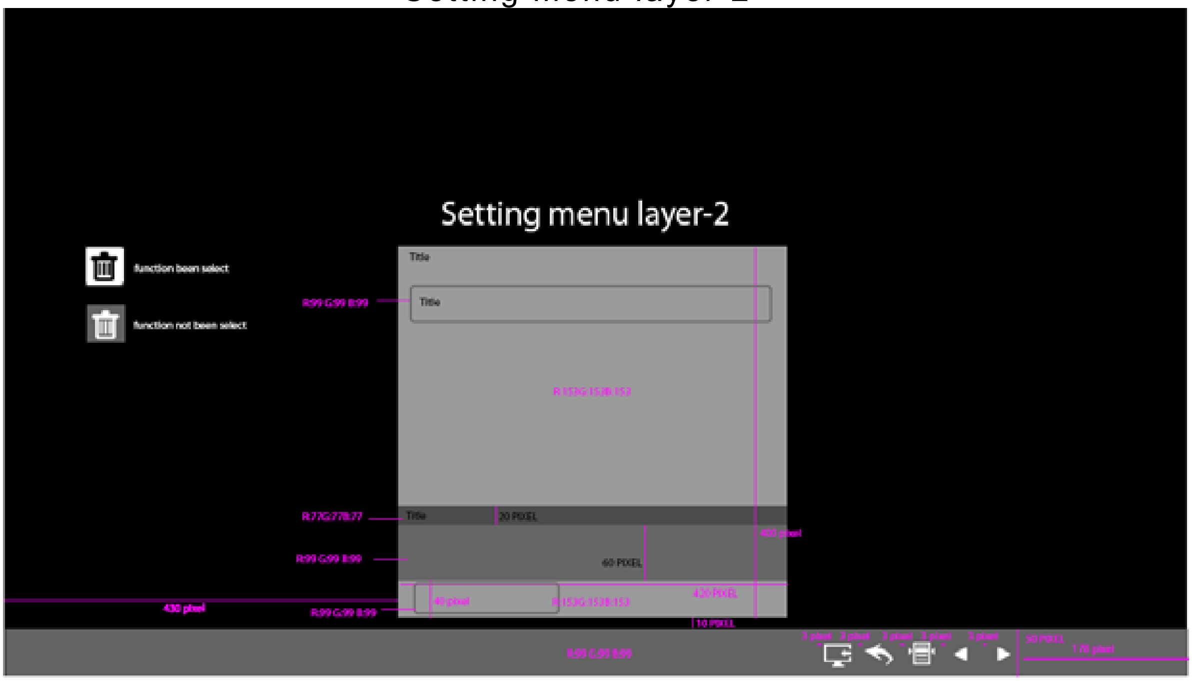




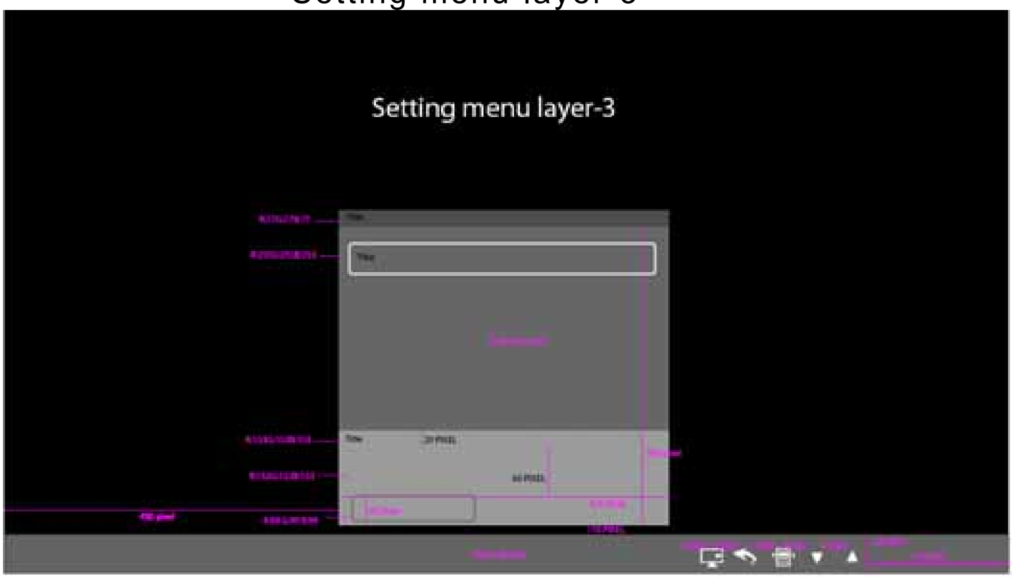
Setting menu layer-1



Setting menu layer-2



Setting menu layer-3



4.11.4.2. DPF photo function test

1.Test the picture as below items:

1).Photo performance
2). Next picture
3). Forward picture
4). Pause
5). Play
6), slide show.
7). Rotate.
8). Browser small and big photo

Check and confirm the function is OK!

2.Test the setting menu as below items:

1),Slideshow time
2). Slideshow effect
3). Auto sleep time
4). Reset
5). Random paly
6), Auto copy
7). Delete all
8). Background color
9). Language

Check and confirm the function is OK!

3.Special define for DPF

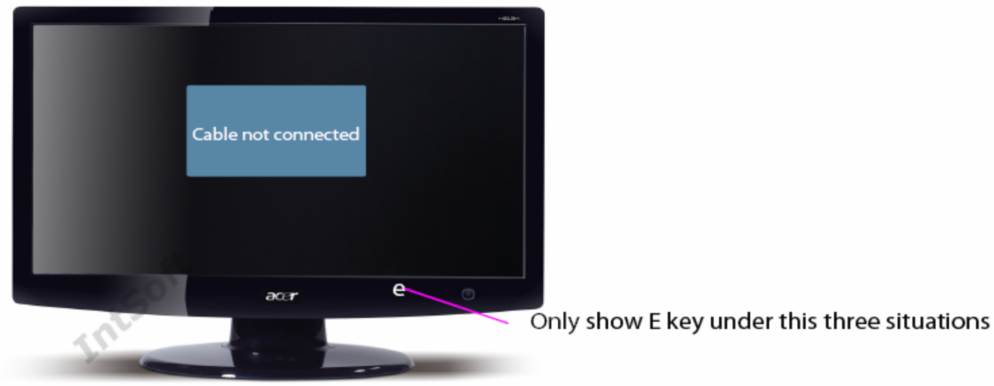
1). Monitor Switch to DPF mode

Monitor warning message "Cable not connect", "No signal" and "Input not support" will use the origianl H warning message.

Cable not connected: If monitor cable not connect to PC, OSD will show an cable not connect tag for 6 secnd, and only power on Ekey softkey button. The other 5 keies will not have any function. If user click Ekey under this situation, monitor will switch to DPF Mode directly.

No signal: If monitor does not have any input signal, monitor will pop up "no signal" warning message for 6 secnd and only power on Ekey softkey button.The other 5 keies will not have any function. If user click Ekey under this situation, monitor will switch to DPF Mode directly.

Input not support: If monitor does not support input signal, monitor will pop up "input not support" warning message for 6 secnd and only power on Ekey softkey button.The other 5 keies will not have any function. If user click Ekey under this situation, monitor will switch to DPF Mode directly.



2). Monitor language must sync with DPF language

3). If Auto sleep timer progress finished,DPF mode will switch monitor mode

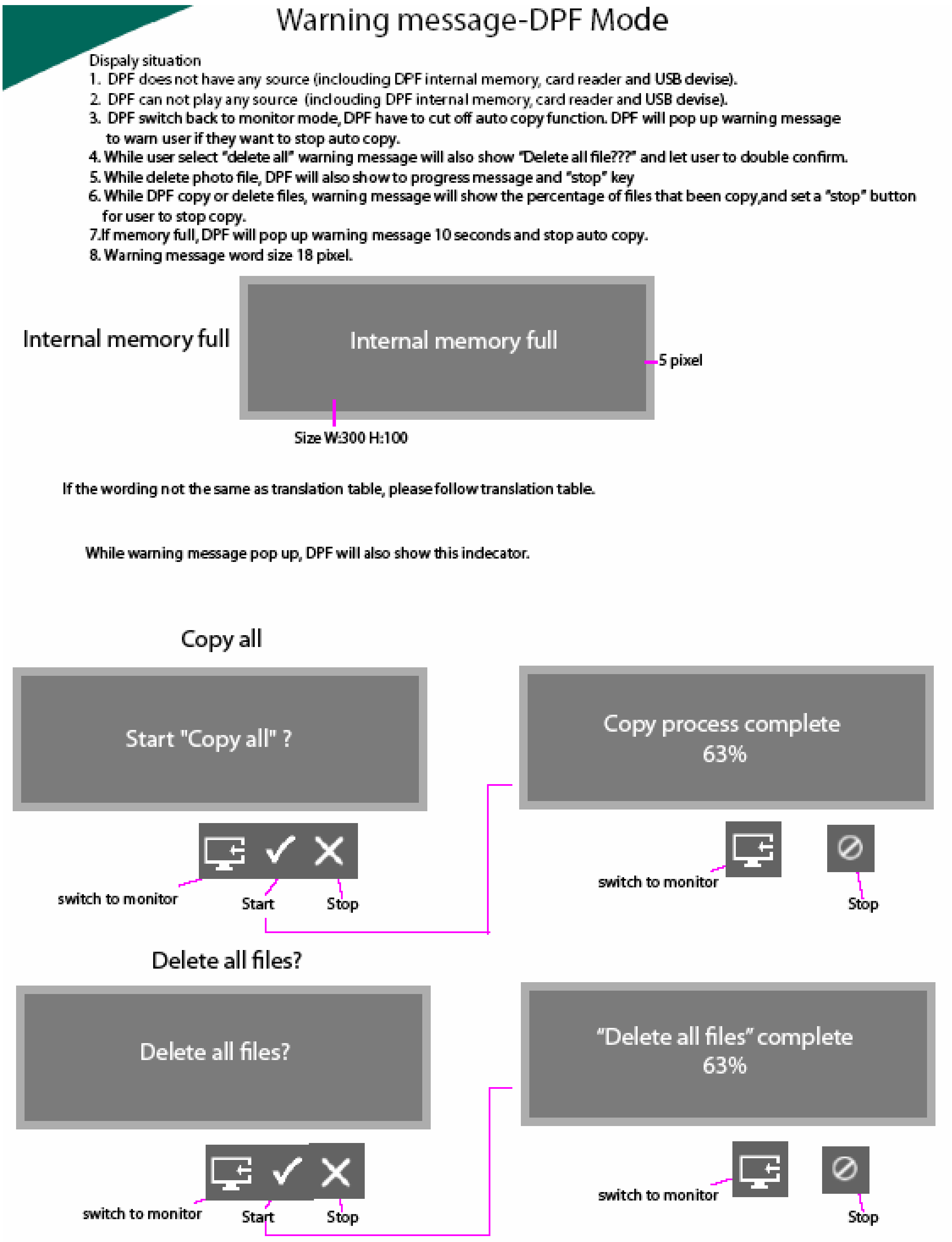
4). If first Monitor mode switch to DPF when AC on and DC on and form power saving ,the screen will display DPF Acer logo

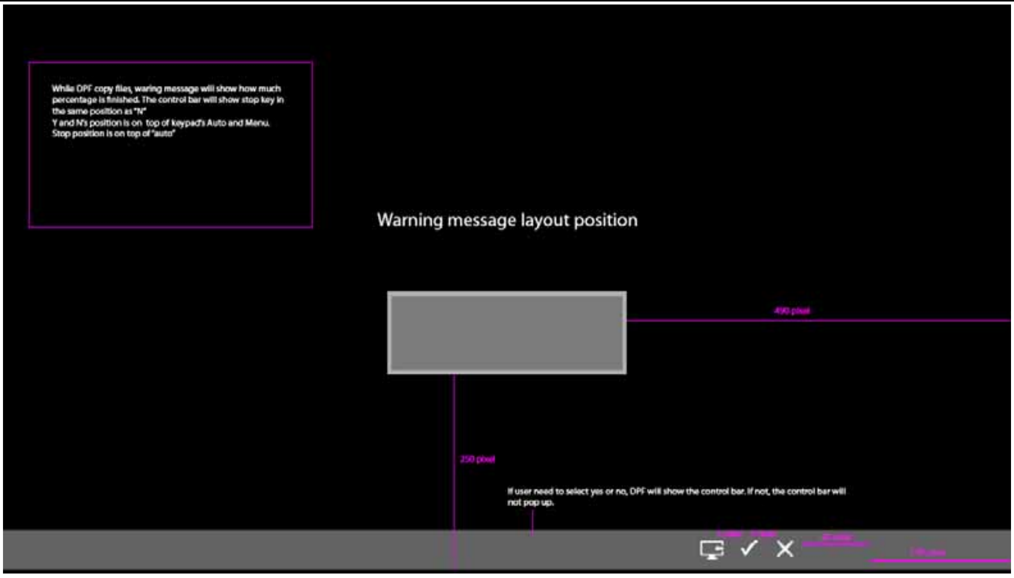
5). If hot_plug any card on DPF mode,the display screen will change to input source select mode .

6). If always press rotate key on play/back mode,the photo will rotate one time.

7). If always press left or right key on browser mode ,if photo less memory range will show the photo else show the last photo

3.Warning message





4.11.5. DPF System Profile

1.DPF-functions overview

Chipset ID	Novatek NT88956H
Output Resolution	**720P**
Output Interface	Analog RGB or Component
USB	1 USB 2.0 Device, 1 USB 2.0 HOST, 1 USB 1.1 HOST (**Reserved**)
Card Reader	SD/CF/xD/MS(Pro)/MMC
Photo Support	JPEG, BMP, TIFF JPEG decode up to 20Mp@<2s
Audio Support	**Reserved**
Video Support	**Reserved**

Hardware Specification

Internal storage	**1G NAND Flash**
Memory	**128Mbit SDRAM**

2.DPF-Input support& image support

1. 5 in 1 Card Reader (SD/ MMC/ MS/ MS pro/xD) & CF Card Reader
   - Pen drive density support up to 16 GB
   - SD/CF drive density support up to 16 GB
   - MMC density support up to 4 GB
   - MS/MS Pro density support up to 8 GB
   - xD density support up to 2 GB

2. USB Host
   - Up to 480Mbps
   - Not support OTG
   - Support USB device 2.0 & Host 2.0
3. Image pixel size support
   - Max: 8000x8000 pixel, Min: 16x16 pixel

5. Function Specifications

All the tests to verify specifications in this section shall be performed under the following standard conditions unless otherwise noted. The standard conditions are:

Temperature	: 25 ± 5°C
Warm-up time	: 30 minutes minimum
Checking display modes	: All the specified modes

5.1 Panel general specifications

5.1.1 General specifications

Item	Describe
Supplier	AUO
Model name	M240HW01-V0
Display Area	531.36 × 298.89
Pixel Pitch	276.75(Per one triad) × 276.75
Display Colors:	16.7M colors (RGB 6-bit + Hi_FRC)

1. 5 in 1 Card Reader (SD/ MMC/ MS/ MS pro/xD) & CF Card Reader
   - Pen drive density support up to 16 GB
   - SD/CF drive density support up to 16 GB
   - MMC density support up to 4 GB
   - MS/MS Pro density support up to 8 GB
   - xD density support up to 2 GB

2. USB Host
   - Up to 480Mbps
   - Not support OTG
   - Support USB device 2.0 & Host 2.0
3. Image pixel size support
   - Max: 8000x8000 pixel, Min: 16x16 pixel

6. Function Specifications

All the tests to verify specifications in this section shall be performed under the following standard conditions unless otherwise noted. The standard conditions are:

Temperature	: 25 ± 5°C
Warm-up time	: 30 minutes minimum
Checking display modes	: All the specified modes

5.2 Panel general specifications

5.2.1 General specifications

Item	Describe
Supplier	AUO
Model name	M240HW01-V0
Display Area	531.36 × 298.89
Pixel Pitch	276.75(Per one triad) × 276.75
Display Colors:	16.7M colors (RGB 6-bit + Hi_FRC)

Input select	A. Press “input key” one time to search (a port with signal in order) B. Show “source icon” at the same time, as searching that port C. Go into next port automatically, if search the port without signal D. Display it, if search the port with signal

5.2.2 Hot Key Operation

FUNCTION	HOT KEY OPERATION						DESCRIPTION
	e Color	AUTO	MENU	◄	►	POWER	
FACTORY MODE	•					ON	Press [e], and then press [POWER] for DC power on. OSD menu will be shown with “F” on the left top. Select “F” for entering factory mode.

5.3 OSD Structure

The On-Screen Display (OSD) shall be an easy to use icon based menu through keypad OSD buttons or remote control unit. The unit shall leave the factory with all OSD controls set to their default values.

First	Second	Third	Fourth	Control Range	Default Value	
Picture	Acer e color Management	empowering Technology	User	---	Standard	
			Text			
			Standard			
			Graphics			
			Movie			
	Brightness	---	---	0～100	User mode	77

					Text mode	44
					Standard mode	77
					Graphics mode	97
					Movie mode	77
	Contrast	---	---	0～100	User mode	50
					Text mode	50
					Standard mode	50
					Graphics mode	60
					Movie mode	56
	H. Position	---	---	0～100	50	
	V. Position			0～100	50	
Focus				0～100	---	
Clock				0～100	50 (1)	
Color Temp		Warm	---	---	---	
		Cool	---	---	---	
		User	Red	0～100	80	
			Green	0～100	80	
			Blue	0～100	80	
Auto Configure		---	---	---	---	
H. Position		---	---	0～100	Depending on the keypad position	
V. Position		---	---	0～100	3	
OSD Timeout		---	---	10～120	10	
Wide Mode		Full	---	---	Full	
		Aspect	---	---		
DDC/CI		ON	---	---	ON	
		OFF				
ACM		ON	---	---	OFF	
		OFF				
Input		VGA	---	---	---	
		DVI	---	---		
		HDMI	---	---		
Language		**EMEA** / **NO-EMEA**	---	---	English	
		English / English	---	---		
		Russian / 繁體中文	---	---		
		Deutsch / Deutsch	---	---		
		Français / Français	---	---		
		Español / Español	---	---		
		Italiano / Italiano	---	---		
		Dutch / 简体中文	---	---		
		Finnish / 日本語	---	---		

Reset		---	---	---	---
Resolution		---	---	---	(2)
H. Freq		---	---	---	
	V. Freq	---	---	---	
	Input Type	---	---	---	
	S/N	---	---	---	

Notes: (1) Clock default 50 is for Visa timing. Others depend on timing.

(2) Depend on timing & S/N

5.4 OSD Translation

5.4.1 Monitor part

Main menu (NO_EMEA)

English (英语)	繁體中文	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	简体中文	日本語
Picture	畫面	Bild	Image	Imagen	Immagine	画面	ピクチャー
Brightness	亮度	Helligkeit	Luminosité	Brillo	Luminosità	亮度	輝度
Contrast	對比	Kontrast	Contraste	Contraste	Contrasto	对比度	コントラスト
H.Position	水平位置	H.Position	H.Position	H.Posicion	O.Posizione	水平位置	水平位置
V.Position	垂直位置	V.Position	V.Position	V.Posicion	V.Posizione	垂直位置	垂直位置
Focus	相位	Fokus	Netteté	Nitidez	Nitidezza	相位	フェーズ
Clock	時脈	Takt	Fréquence	Reloj	Orologio	时序	クロック
Colour Temp	色溫	Farbtemp.	Temp. Couleur	Temp. Color	Temp. Colore	色温	色溫度
Warm	暖色溫	Warm	Chaud	Càlido	Caldo	暖色温	暖色
Cool	冷色溫	Kalt	Clair	Frio	Freddo	冷色温	寒色
User	使用者設定	Anwender	Utilisateur	Usuario	Utente	使用者设定	ユーザー設定
Red	紅色	Rot	Rouge	Rojo	Rossa	红色	赤
Green	綠色	Grün	Vert	Verde	Verde	绿色	緑
Blue	藍色	Blau	Bleu	Azul	Blu	蓝色	青
Auto Config	自動調整	Autom. Abgl.	Autoréglage	Autoajuste	Autoregolazione	自动调整	自動調整
OSD	**OSD**						
OSD Timeout	OSD 顯示時間設定	OSD-Dauer	Délai de l'OSD	T. de espera OSD	Intervallo OSD	OSD 显示时间设定	OSD 表示時間設定
Setting	設定	Einstellung	Réglages	Configuración	Impostazione	设置	設定
Wide Mode	寬螢幕模式	Vollbild	Plein écran	Completa	Schermo intero	宽屏模式	ワイドモード
Full	全螢幕	Vollbild	Plein écran	Completa	Pieno	全屏	全画面
Aspect	Aspect						
Input	輸入	Eingang	Entrée	Entrada	Input	输入	入力
Language	語言	Sprache	Langue	Idioma	Lingua	语言	言語
Reset	恢復出廠模式	Rücksetzen	Restaurer	Reiniciar	Resetare	恢复出厂模式	リセット
Please Wait	請稍待	Bitte warten	Veuillez patienter	Espere, por favor	Attendere prego	请稍待	お待ちください
Information	資訊	Info	Informations	Información	Informazioni	信息	情報
Exit	結束調整	Beenden	Quitter	Salida	Uscita	退出菜单	終了
Enter	進入	Eingabe	Entrez	Introducir	Invio	进入	選択
Move	移動	Beweg.	Dépla.	Mover	Muovi	移动	移動
ON	開	EIN	Allumé	ACTIVADO	ATTIVA	开启	オン
OFF	關	Aus	OffEteinte	Apagado	Spento	关闭	オフ
Volume	音量	Lautstärke	Volume	Volumen	Volume	音量	音量

Message menu: (NON_EMEA)

English (英语)	繁體中文	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	简体中文	日本語
Auto Config Please Wait	自動調整 請稍待	Autom. Abgl. Bitte warten	Autoréglage Veuillez patienter	Autoajuste Espere, porfavor	Autoregolazione Attendere prego	自动调整 请稍待	自動調整 お待ちください
Cable Not Connected	無訊號線 連接	Leitung nicht angeschlossen	Câble non connecté	Cable no conectado	Cavo non connesso	信号线 无连接	ケーブルが接続 されて いません
Input Not Supported	不支援 輸入訊號	Frequenzen nicht unterstützt	Fréquences non supportées	Frequencias no soportadas	Frequenza non supportata	输入 不支援	入力はサポート されて いません
No Signal	無訊號	Kein signal	Pas de signal	Sin señal	Assenza segnale	无讯号	信号なし

English (英语)	Russian (俄语)	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	Dutch (荷兰语)	Finnish (芬兰语)
Picture	Изображ.	Bild	Image	Imagen	Immagine	Beeld	Kuva
Brightness	Яркость	Helligkeit	Luminosité	Brillo	Luminosità	Helderheid	Kirkkaus
Contrast	Контрастность	Kontrast	Contraste	Contraste	Contrasto	Contrast	Kontrasti
H.Position	Полож. по гориз.	H.Position	H.Position	H.Posicion	O.Posizione	H. positie	Vaakasijainti
V.Position	Полож. по верт.	V.Position	V.Position	V.Posicion	V.Posizione	V. positie	Pystysijainti
Focus	Фокусировка	Fokus	Netteté	Nitidez	Nitidezza	Scherpstelling	Tarkennus
Clock	Частота	Takt	Fréquence	Reloj	Orologio	Klok	Taajuus
Colour Temp	Цвет.темп.	Farbtemperatur	Temp. Couleur	Temp. Color	Temp. Colore	Kleurtemp.	Värin lämpöisyys
Warm	Теплый	Warm	Chaud	Càlido	Caldo	Warm	Lämmin
Cool	Холодный	Kalt	Clair	Frio	Freddo	Koel	Viileä
User	Пользоват.	Anwender	Utilisateur	Usuario	Utente	Gebruiker	Käyttäjä
Red	Красный	Rot	Rouge	Rojo	Rossa	Rood	Punainen
Green	Зеленый	Grün	Vert	Verde	Verde	Groen	Vihreä
Blue	Синий	Blau	Bleu	Azul	Blu	Blauw	Sininen
Auto Config	Автонастройка	Autom. Abgl.	Autoréglage	Autoajuste	Autoregolazione	Autom.configuratie	Autom. asetukset
OSD	OSD						
OSD Timeout	Вр. отобр. Меню	OSD-Dauer	Délai de l'OSD	T. de espera OSD	Intervallo OSD	Time-out OSD	Aikakatkaisu
Setting	Настр.	Einstellung	Réglages	Configuración	Impostazione	Instelling	Asetus
Wide Mode	Широкоэк.реж.	Bildformate	Mode Large	Modo panorámico	Modo Wide	Breedbeeld modus	Laajakuva
Full	Полное	Vollbild	Plein écran	Completa	Pieno	Volledig	Täysikuva
Aspect	Aspect						
Input	Вход	Eingang	Entrée	Entrada	Input	Ingang	Tulo
Language	Язык	Sprache	Langue	Idioma	Lingua	Taal	Kieli
Reset	Сброс	Rücksetzen	Restaurer	Reiniciar	Resetare	Opn.instellen	Nollaus
Please Wait	Подождите	Bitte warten	Veuillez patienter	Espere, por favor	Attendere prego	Een ogenblik geduld	Odota
Information	Информация	Info	Informations	Información	Informazioni	Informatie	Informaatio
Information	Информация	Info	Informations	Información	Informazioni	Informatie	Informaatio
Exit	Выход	Beenden	Quitter	Salida	Uscita	Afsluiten	Lopeta
Enter	Ввод	Eingabe	Entrez	Introducir	Invio	Enter	Syötä
Move	Переме	Beweg.	Dépla.	Mover	Muovi	Verpl.	Liiku
ON	Вкл	EIN	Allumé	ACTIVADO	ATTIVA	AAN	PÄÄLLÄ <ON>
OFF	Выкл	Aus	OffEteinte	Apagado	Spento	Uit	Pois päältä
Volume	Громкость	Lautstärke	Volume	Volumen	Volume	Volume	Äänenvoim.

Color management OSD (scenario OSD) **language: (NON_EMEA)**

English (英语)	繁體中文	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	简体中文	日本語

Standard	標準	Standard	Standard	Estándar	Standard	标准	標準
Text	文字	Text	Texte	Texto	Testo	文本	テキスト
Graphics	圖形	Grafiken	Images	Gráficos	Grafica	图形	グラフィックス
Movie	電影	Spielfilm	Film	Película	Film	电影	ムービー
User	使用者	Benutzer	Utilisateur	Usuario	Utente	用户	ユーザー
Adjust/Exit	調整/結束	Abstimmen/Beenden	Ajuster/Quitter	Ajuste/salir	Regola/Esci	调节/退出	調整/終了
Select	選擇	Auswahl	Sélectionner	Seleccionar	Seleziona	选取	選択

Main menu (EMEA)

Message menu: (EMEA)

English (英语)	Russian (俄语)	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	Dutch (荷兰语)	Finnish (芬兰语)
Auto Config Please Wait	Автонастройка, подождите...	Autom. Abgl. Bitte warten	Autoréglage Veuillez patienter	Autoajuste Espere, por favor	Autoregolazione Attendere prego	Bezig met automatische configuratie, een ogenblik geduld	Autom. asetukset. Odota
Cable Not Connected	Кабель не подключен	Leitung nicht angeschlossen	Câble non connecté	Cable no conectado	Cavo non connesso	Kabel niet aangesloten	Kaapeli ei kiinni
Input Not Supported	Вход не поддерживается	Frequenzen nicht unterstützt	Fréquences non supportées	Frequencias no soportadas	Frequenza non supportata	Ingang niet ondersteund	Tuloa ei tueta
No Signal	Нет сигнала	Kein signal	Pas de signal	Sin señal	Assenza segnale	Geen signaal	Ei signaalia

Color management OSD(scenario OSD) **language: (EMEA)**

English (英语)	Russian (俄语)	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	Dutch (荷兰语)	Finnish (芬兰语)
Standard	Стандарт	Standard	Standard	Estándar	Standard	Standaard	Vakio
Text	Текст	Text	Texte	Texto	Testo	Tekst	Teksti
Graphics	Изображение	Grafiken	Images	Gráficos	Grafica	Grafische	Grafiikka
Movie	Кино	Spielfilm	Film	Película	Film	Film	Elokuva
User	Пользователь	Benutzer	Utilisateur	Usuario	Utente	Gebruiker	Käyttäjä
Adjust/Exit	Настроить /Выход	Abstimmen/Beenden	Ajuster/Quitter	Ajuste/salir	Regola/Esci	Aanpassen/verlaten	Säädä/Lopeta
Select	Выбор	Auswahl	Sélectionner	Seleccionar	Seleziona	Selecteren	Valitse

6. Mechanical

6.1 Dimension

Dimension	Spec
Width	574.96mm
Height	430.29mm(W/Base), 408.11mm(W/O Base)
Depth	171.62mm(W/Base), 106.43mm(W/O Base)

Monitor Weight	5.6±0.3Kg

6.2 Cabinet Material

Cabinet Material	Spec
Cabinet Plastic Material	ABS HB(PMMA)
Front Bezel	BLACK
Back Cover	BLACK
Base	BLACK
Cabinet Texture	ACER SPECIFICATION

6.3 Mechanical Specification

Mechanical	Spec
Bezel Gap Specification	≦1.3mm
Screen printed Parts	Front bezel

6.4 Base Mechanical Interface

items	Spec
Tilt	Compliance with TCO03, -4°(+/-1°) ~+14°(+/-1°)
Wall Mount	100mm x 100 mm

7. Package

7.1 Unit Package Specification

7.1.1 Units package

Items	Spec
Packaging	Refer to ME PACKING SPEC
Ink	COLOR
Length	632+/-2.0mm
Height	494+/-2.0mm
Width	139+/-2.0mm
Gross Weight	7.9±0.3kg
Units per Pallet	56sets/pallet
40' /20' Container Loading, Palletized	1120sets/560sets

7.1.2 Unit Packing Vibration

Testing with vibration shall be done in each of three mutually perpendicular axes. Axes are referenced to the position of system as it normally sits in front of user, i.e., Front-to-back, side-to-side and top-to-bottom.

7.1.2.1 Random Vibration

Items	Description
Sweep Frequency	1~200Hz
Amplitude	1.14 Grms
Duration Time	30 minute each axis
Direction	3 mutually perpendicular axes (x, y, z)

RANDOM VIBRATION SPECTRUM BREAK POINTS

Frequency (Hz)	PSD, G^2/Hz
1	0.0001
4	0.01
100	0.01
200	0.001

7.1.3 Non operation Thermal Shock Test

Item	Description
Temperature	-20^{0}C to 60^{0}C
Reset cycles times	25ºC>60ºC (10hrs)>25ºC (2hrs)>-20ºC (10hrs)>25ºC 3cycles ,every transition time 0.5 hr,
Total cycles	3 cycles

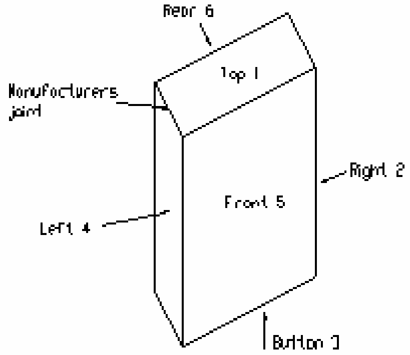
7.1.4 Package Drop

Drop height (Select drop height according to the gross weight refer to the table at below)

Gross Weight(kg)	1.0<W≦9.0
Drop Height(cm)	76
	√

Drop sequence and orientation

Drop	Drop onto	Type Drop	Figure
Step 1	Corner(2-3-5)of package	Corner	
Step 2	Edge(3-5) of package	Edge	
Step 3	Edge(2-3) of package	Edge	
Step 4	Edge(2-5) of package	Edge	
Step 5	Face(bottom-3)of package	Flat	
Step 6	Face(left-4) of package	Flat	
Step 7	Face(front-5) of package	Flat	
Step 8	Face(right-2) of package	Flat	
Step 9	Face(rear-6) of package	Flat	
Step 10	Face(Top-1) of package	Flat	



Mechanical and electrical damage should not exist after vibration test, and shall be submitted for approval customer before mass production.

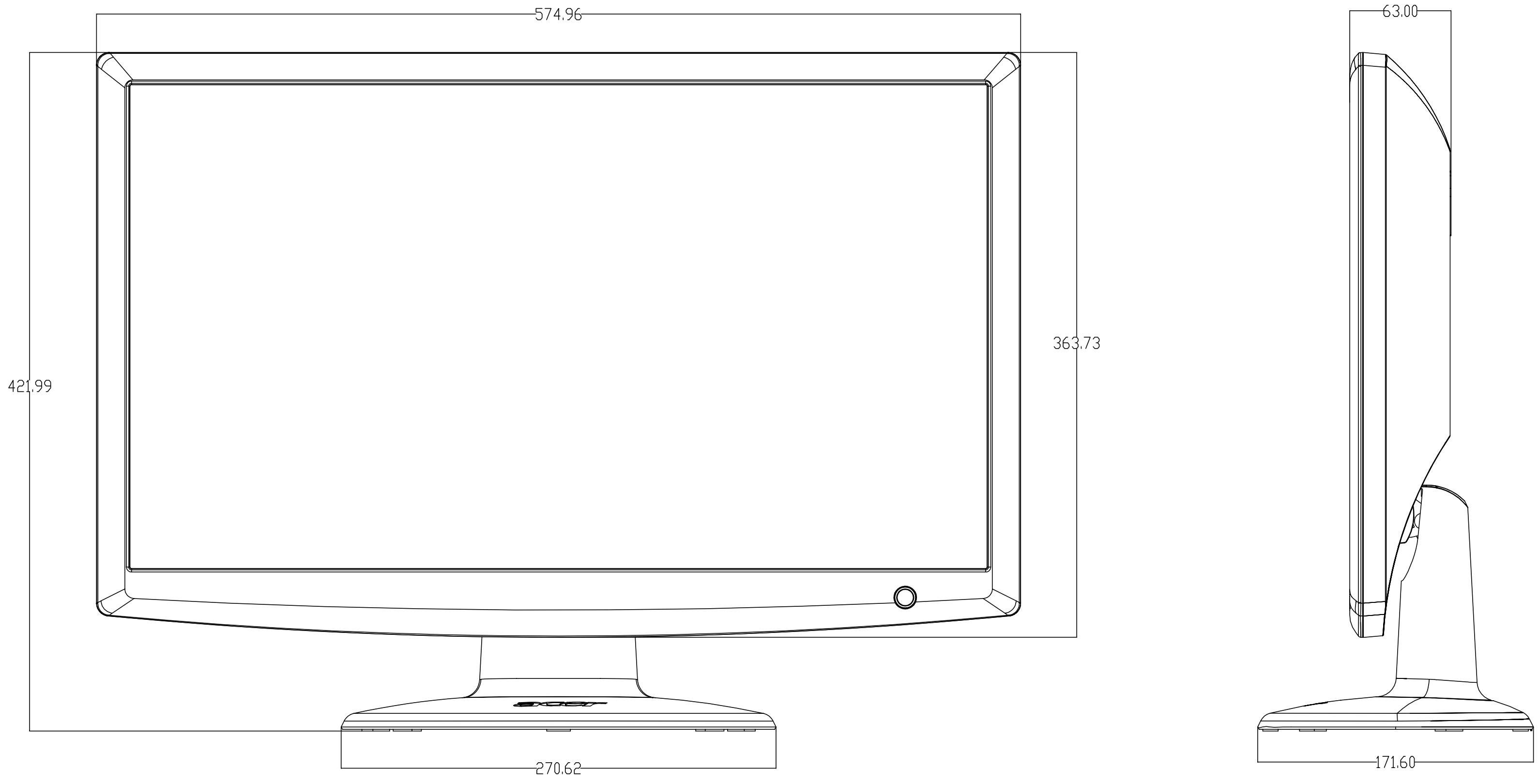
8. Marking and Identification

8.1 S/N Label

The approval marking is required by the countries of sales destination.

8.2 Carton label

The approval marking is required by the countries of sales destination.



ZONE	REV	DESCREPTION	DATE	APPROVED

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS.
DECIMALS: ANGLES:
.X = .X =
.XX = .XX =

MATL.

FINISH

SI - METRIC
THIRD ANGLE PROJECTION

MODEL NO. ACERD240H

SIGNATURE	DATE
DRAWN. Ke,Liu	2008/08/10

FOXCONN CORP. (INNOLUX)

TITLE ID Drawing

A1 PART NO. REV.

SCALE: DWG NO. SHEET

02. Flat Panel Specification

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B. Electrical Specifications	
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2. Absolute maximum ratings	
3. Electrical characteristics	
a. Typical operating conditions	
b. Display color vs. input data signals	
c. Input signal timing	
d. Display position	
e. Backlight driving conditions	
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1.0 Handling Precautions

1) Since front polarizer is easily damaged, pay attention not to scratch it.
2) Be sure to turn off power supply when inserting or disconnecting from input connector.
3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
7) Do not open or modify the Module Assembly.
8) Do not press the reflector sheet at the back of the module to any directions.
9) In case if a Module has to be put back into the packing container slot after once it was taken out from the container, do not press the center of the CCFL reflector edge. Instead, press at the far ends of the CCFL Reflector edge softly. Otherwise the TFT Module may be damaged.
10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
11) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
12) Cold cathode fluorescent lamp in LCD contains a small amount of mercury. Please follow local ordinances or regulations for disposal.
13) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
14) The LCD module is designed so that the CCFL in it is supplied by Limited Current Circuit (IEC60950 or UL1950). Do not connect the CCFL in Hazardous Voltage Circuit.

2.0 General Description

This specification applies to the 24 inch-wide Color a-Si TFT-LCD Module M240HW01.The display supports the Full HD - 1920(H) x 1080(V) screen format and 16.7M colors (RGB 6-bits + Hi-FRC data). All input signals are 2-channel LVDS interface and this module doesn't contain an inverter board for backlight.

2.1 Display Characteristics

The following items are characteristics summary on the table under 25℃ condition:

ITEMS	Unit	SPECIFICATIONS
Screen Diagonal	[mm]	609.7(24.0")
Active Area	[mm]	531.36 (H) x 298.89 (V)
Pixels H x V		1920(x3) x 1080
Pixel Pitch	[um]	276.75 (per one triad) ×276.75
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		TN Mode, Normally White
White Luminance (Center)	[cd/m^2]	300 cd/m^2 (Typ.)
Contrast Ratio		1000 (Typ.)
Optical Response Time	[msec]	5ms (Typ., on/off)
Nominal Input Voltage VDD	[Volt]	+5.0 V
Power Consumption (VDD line + CCFL line)	[Watt]	35 W (Typ.) (without inverter, all black pattern)
Weight	[g]	2755 (Typ.)
Physical Size	[mm]	556.0 (W) x 323.2 (H) x 16.35 (D) typ
Electrical Interface		Dual channel LVDS
Support Color		16.7M colors (RGB 6-bit + Hi_FRC)
Surface Treatment		Anti-Glare, 3H
Temperature Range Operating Storage (Shipping)	 [^{o}C] [^{o}C]	 0 to +50 -20 to +60
RoHS Compliance		RoHS Compliance

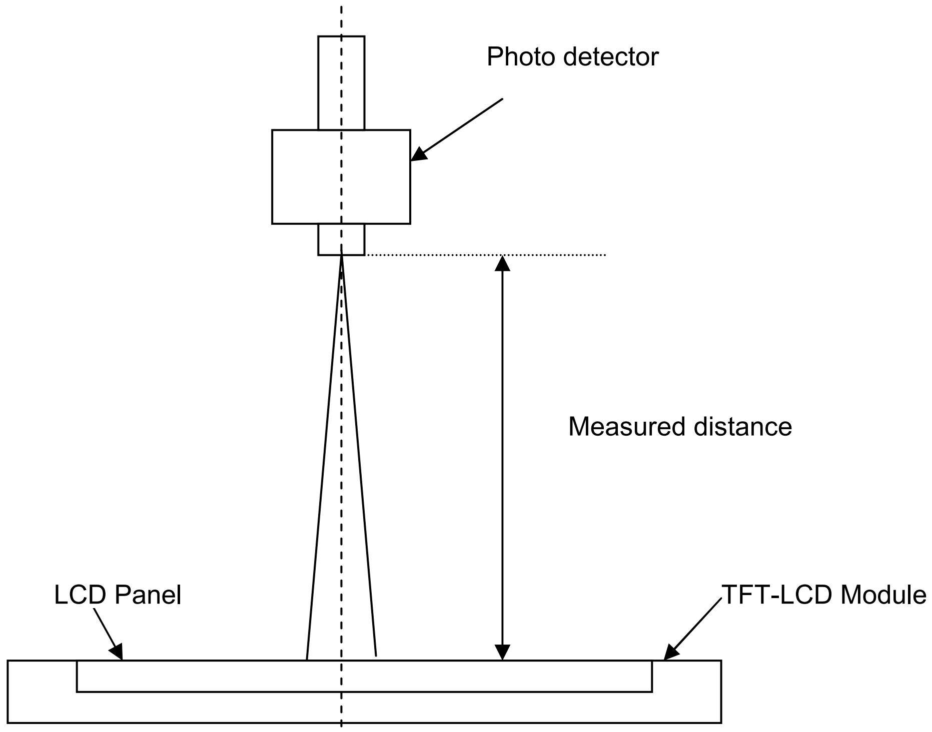
2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25℃:

Item	Unit	Conditions	Min.	Typ.	Max.	Note
Viewing Angle	[degree]	Horizontal (Right) CR = 10 (Left)	150	170	- -	2
		Vertical (Up) CR = 10 (Down)	140	160	- -	
Contrast ratio		Normal Direction	600	1000	-	3
Response Time	[msec]	Raising Time (T_{rR})	-	3.5	7.5	4
		Falling Time (T_{rF})	-	1.5	2.5	
		Raising + Falling	-	5	10	
Color / Chromaticity Coordinates (CIE)		Red x	0.619	0.649	0.679	5
		Red y	0.308	0.338	0.368	
		Green x	0.259	0.289	0.319	
		Green y	0.579	0.609	0.639	
		Blue x	0.116	0.146	0.176	
		Blue y	0.040	0.070	0.100	
Color Coordinates (CIE) White		White x	0.283	0.313	0.343	
		White y	0.299	0.329	0.359	
Central Luminance	[cd/m^2]		250	300	-	6
Luminance Uniformity	[%]		75	80	-	7
Crosstalk (in 60Hz)	[%]				1.5	8
Flicker	dB				-20	9

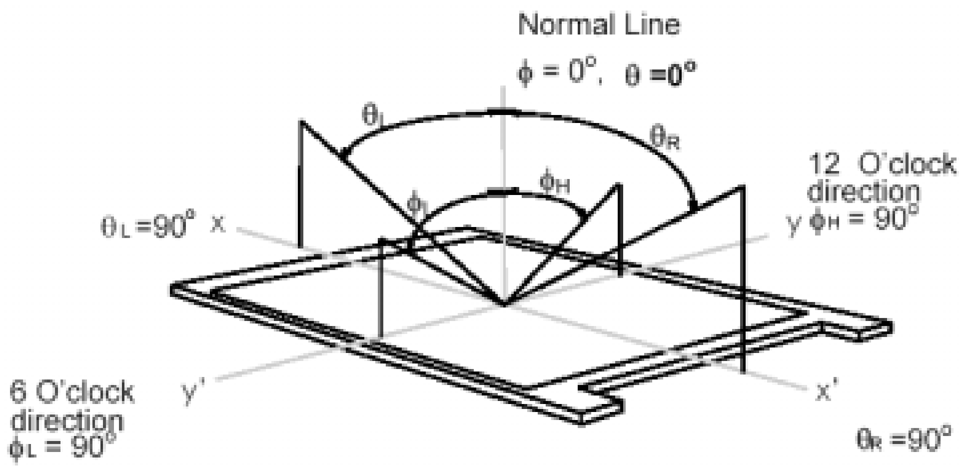
Note 1: **Measurement method**

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring (at surface 35℃). In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room.



Note 2: **Definition of viewing angle** measured by ELDIM (EZContrast 88)

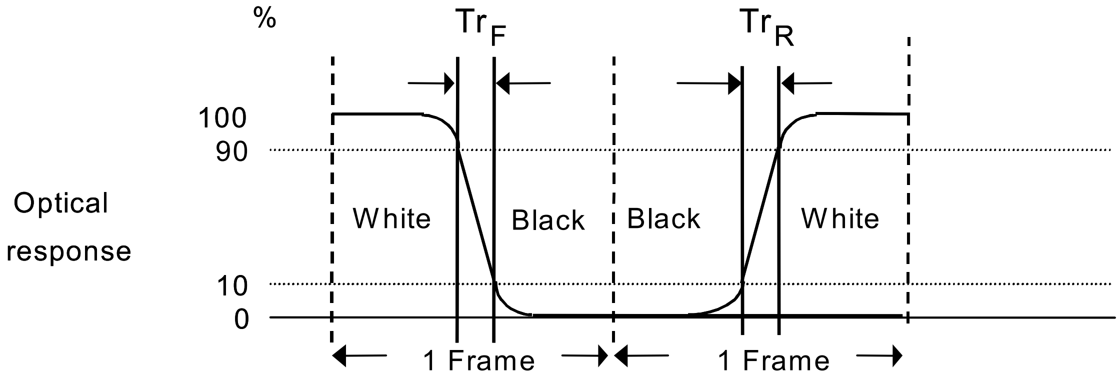
Viewing angle is the measurement of contrast ratio ≧10, at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° (θ) horizontal left and right and 90° (Φ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.



Note 3: **Contrast ratio** is measured by TOPCON SR-3

Note 4: **Definition of Response time** measured by Westar TRD-100A

The output signals of photo detector are measured when the input signals are changed from "Full Black" to "Full White" (rising time, Tr_R), and from "Full White" to "Full Black" (falling time, Tf_F), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.

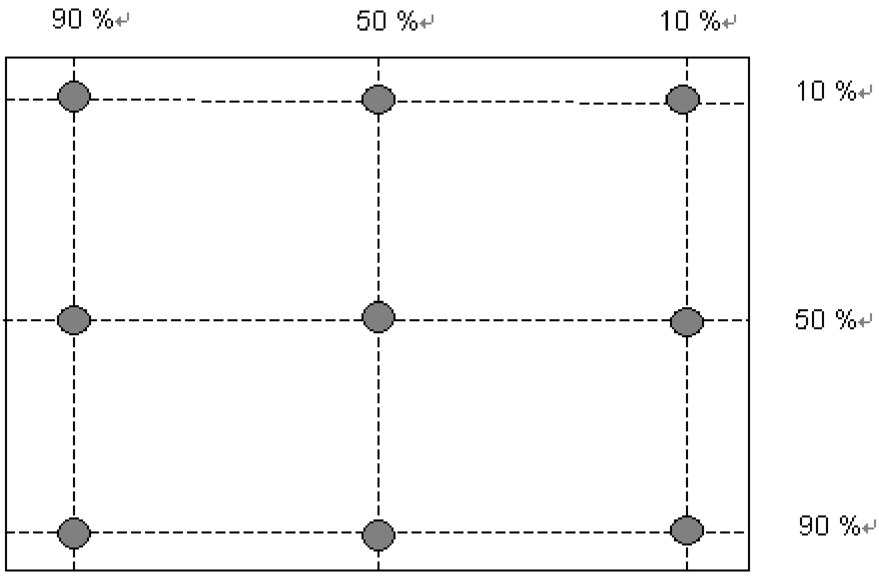


$Tr_R + Tf_F$ = 5 msec (typ.).

Note 5: **Color chromaticity and coordinates (CIE) is** measured by TOPCON SR-3

Note 6**: Central luminance is** measured by TOPCON SR-3

Note 7: **Luminance uniformity of these 9 points is defined as below and** measured by TOPCON SR-3



$$\text{Uniformity} = \frac{\text{Minimum Luminance in 9 points (1 - 9)}}{\text{Maximum Luminance in 9 Points (1 - 9)}}$$

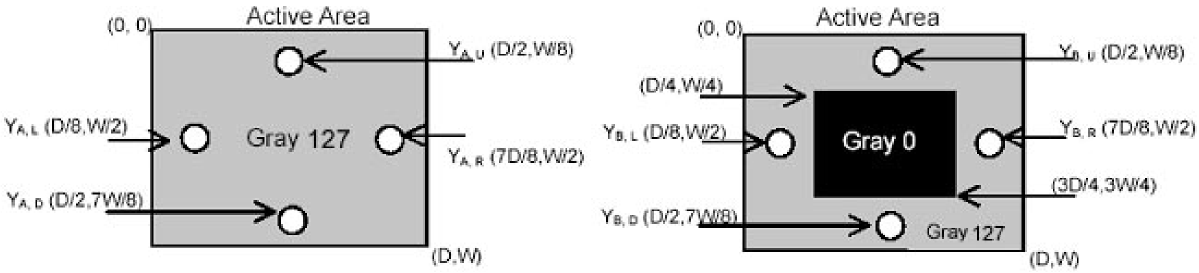
Note 8: **Crosstalk is defined as below and** measured by TOPCON SR-3

CT = | YB – YA | / YA Ｘ 100 (%)

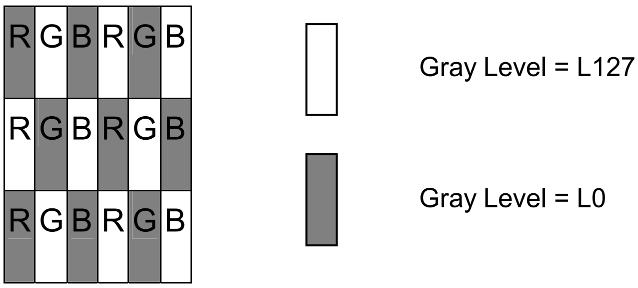
Where

YA = Luminance of measured location without gray level 0 pattern (cd/m2)

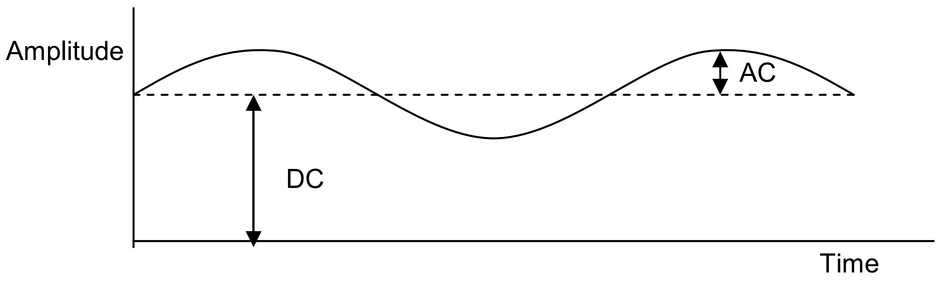
YB = Luminance of measured location with gray level 0 pattern (cd/m2)



Note 9: **Test Patern: Subchecker Pattern** measured by TOPCON SR-3



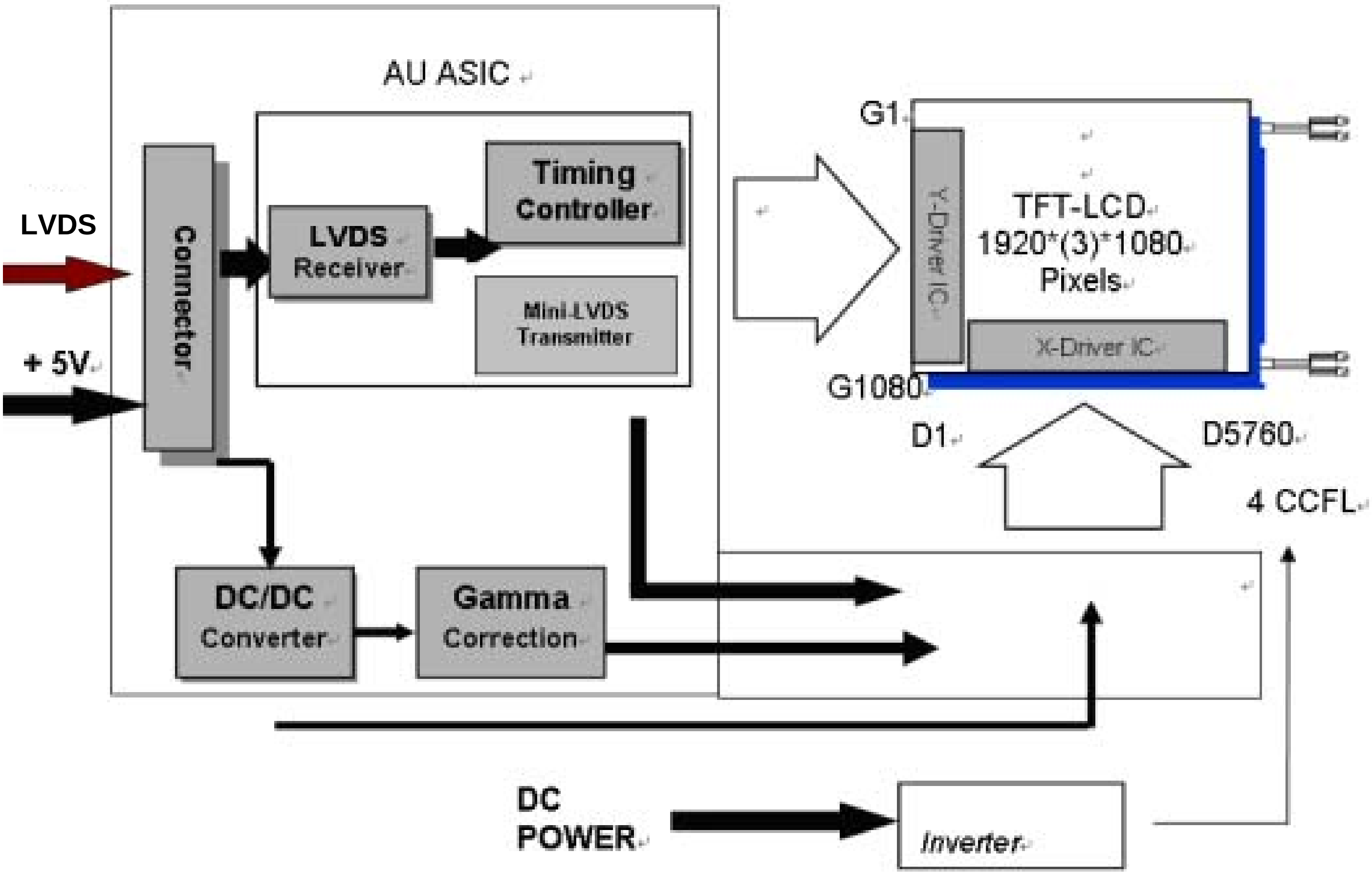
Method: Record dBV & DC value with TRD-100



$$\text{Flicker (dB)} = 20\log\frac{\text{AC Level(at 30 Hz)}}{\text{DC Level}}$$

3.0 Functional Block Diagram

The following diagram shows the functional block of the 24.0 inch Color TFT-LCD Module:



I/F PCB Interface:

JAE FI-XB30SSL-HF15

STM MSBKT2407P30HB

Mating Type:

FI-X30HL (Locked Type)

4.0 Absolute Maximum Ratings

Absolute maximum ratings of the module are as following:

4.1 TFT LCD Module

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	0	6.0	[Volt]	***Note 1,2***

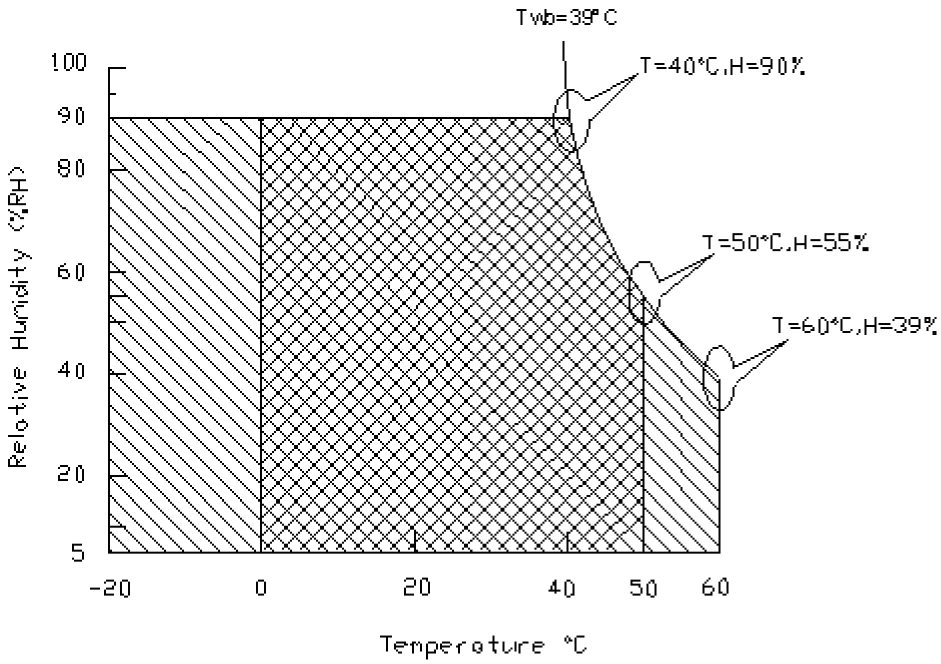
4.2 Backlight Unit

Item	Symbol	Min	Max	Unit	Conditions
CCFL Current	ICFL	3.0	8.0	[mA] rms	***Note 1,2***

4.3 Absolute Ratings of Environment

Item	Symbol	Min.	Max.	Unit	Conditions
Operating Temperature	TOP	0	+50	[^{o}C]	***Note 3***
Operation Humidity	HOP	5	90	[%RH]	
Storage Temperature	TST	-20	+60	[^{o}C]	
Storage Humidity	HST	5	90	[%RH]	

Note 1: With in Ta (25℃)
Note 2: Permanent damage to the device may occur if exceeding maximum values
Note 3: For quality perfermance, please refer to AUO IIS(Incoming Inspection Standard).



Operating Range

Storage Range

5.0 Electrical characteristics

5.1 TFT LCD Module

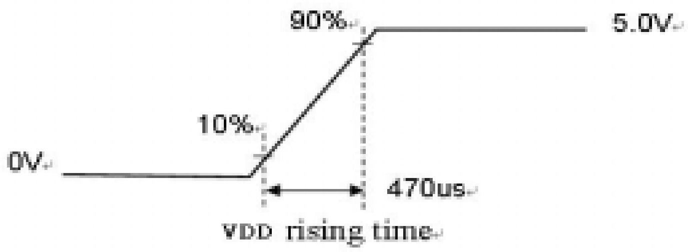
5.1.1 Power Specification

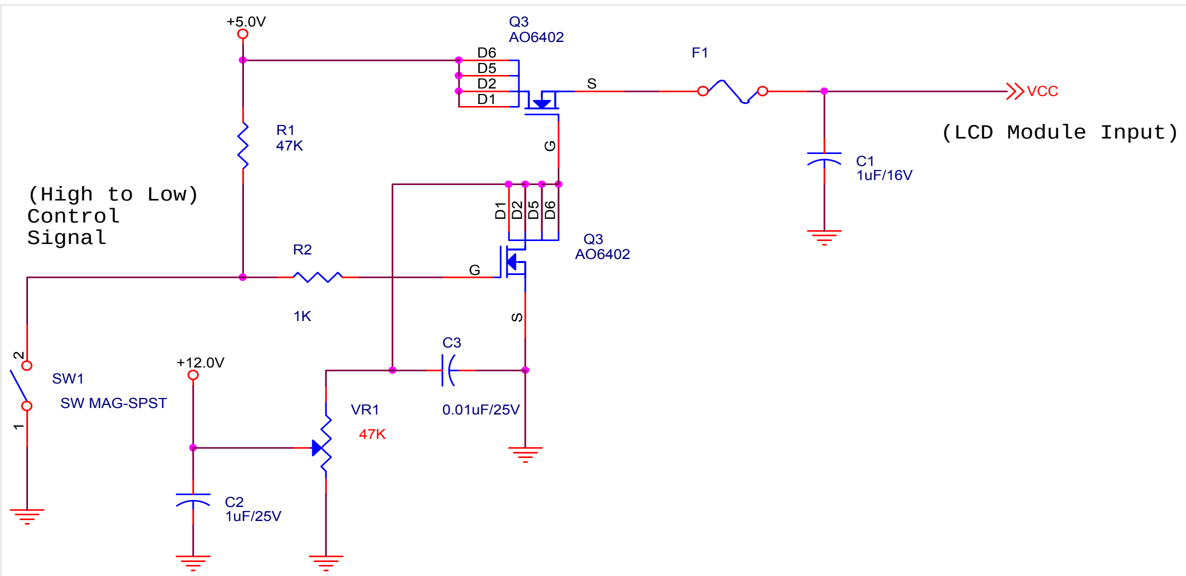
Input power specifications are as following:

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
VDD	Logic/LCD Drive Voltage	4.5	5.0	5.5	[Volt]	+/-10%
IDD1	Input Current	-	0.6	1.2	[A]	VDD= 5.0V,All black Pattern, At 60Hz
PDD1	VDD Power	-	3	6	[Watt]	VDD= 5.0V,All black Pattern, At 60Hz
IRush	Inrush Current	-	-	3	[A]	**Note 1**
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	300	[mV] p-p	VDD= 5.0V, All Black Pattern At 75Hz

Note 1: Measurement conditions:

The duration of rising time of power input is 470 us.





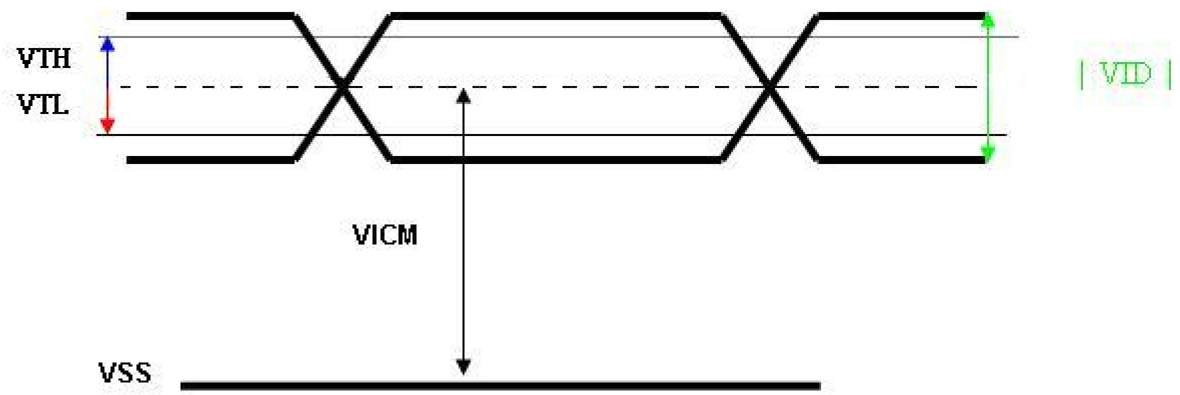
5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off. Please refer to specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Characteristics of each signal are as following:

Symbol	Parameter	Min	Typ	Max	Units	Condition
VTH	Differential Input High Threshold	-	+50	+100	[mV]	VICM = 1.2V ***Note 1***
VTL	Differential Input Low Threshold	-100	-50	-	[mV]	VICM = 1.2V ***Note 1***
∣VID∣	Input Differential Voltage	100	-	600	[mV]	***Note 1***
VICM	Differential Input Common Mode Voltage	+1.0	+1.2	+1.5	[V]	VTH-VTL = 200MV (max) ***Note 1***

Note 1: LVDS Signal Waveform



5.2 Backlight Unit

Parameter guideline for CCFL Inverter is under stable conditions at 25℃ (Room Temperature):

Parameter	Min.	Typ.	Max.	Unit	Note
CCFL Standard Current (ISCFL)	7.0	7.5	8.0	[mA] rms	
CCFL Operation Current (IRCFL)	3.0	7.5	8.0	[mA] rms	***2***
CCFL Frequency (FCFL)	40	53	60	[KHz]	***3, 4***
CCFL Ignition Voltage (ViCFL, Ta= 0℃)	2000	-	-	[Volt] rms	***5***
CCFL Ignition Voltage (ViCF, Ta= 25℃)	1850	-	-	[Volt] rms	
CCFL Operation Voltage (VCFL)	-	900 (@7.5mA)	-	[Volt] rms	***6***
CCFL Power Consumption (PCFL)	-	27	-	[Watt]	
CCFL Life Time (LTCFL)	40,000	50,000	-	[Hour]	***7***

Note 1: Typ. values are AUO recommended design values.

*1 All of characteristics listed are measured under the condition using the AUO test inverter.

*2 It is recommended to check the inverter carefully. Sometimes, interfering noise stripes appear on the screen, and substandard luminance or flicker at low power may happen.

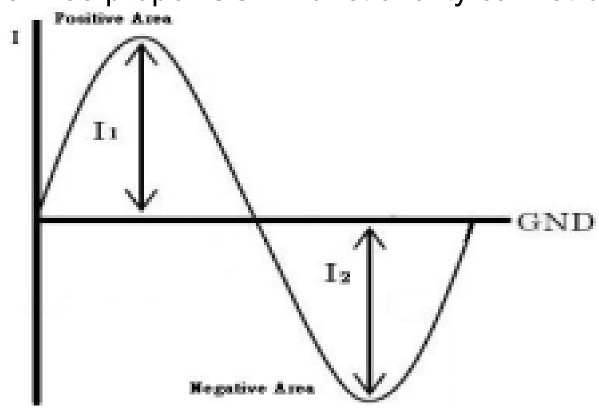
*3 While designing an inverter, it is suggested to check safety circuit very carefully. Impedance of CCFL, for instance, becomes more than 1 [M ohm] when CCFL is damaged.

*4 Generally, CCFL has certain delay time after applying kick-off voltage. It is recommended to keep on applying kick-off voltage for 1 [Sec] until discharge.

*5 Reducing CCFL current will increase CCFL discharge voltage and generally increases CCFL discharge frequency. So all the parameters of the inverter should be carefully designed so the inverter will not produce too much leakage current from high-voltage output.

*6 Both CCFLs in the CCFL set (2 CCFL lamps on each side of a panel) is designed for identical phase driving. Reversed phase driving of CCFL set is not encouraged.

*7 For designing CCFL current, it is highly recommanded to use symmetric and consistent sinusoidal wave for each CCFL input current with asymmetric ration of 10% or less in both postive area and negative area (ie. $0.9*\sqrt{2}*I_{rms} < I_1$ & $I_2 < 1.1*\sqrt{2}*I_{rms}$) as refer to the following diagram, otherwise proper CCFL functionality cannot be guarantied.



Note 2: CCFL standard current is measured at 25±2℃.

Note 3: CCFL discharge frequency should be carefully determined to avoid interference between inverter and TFT LCD.

Note 4: The frequency range will not affect lamp life and reliability characteristics.

Note 5: CCFL inverter should be able to release power that has generating capacity exceeding 2000 volt. Lamp units need minimum voltage, 2000 Volt, for ignition.

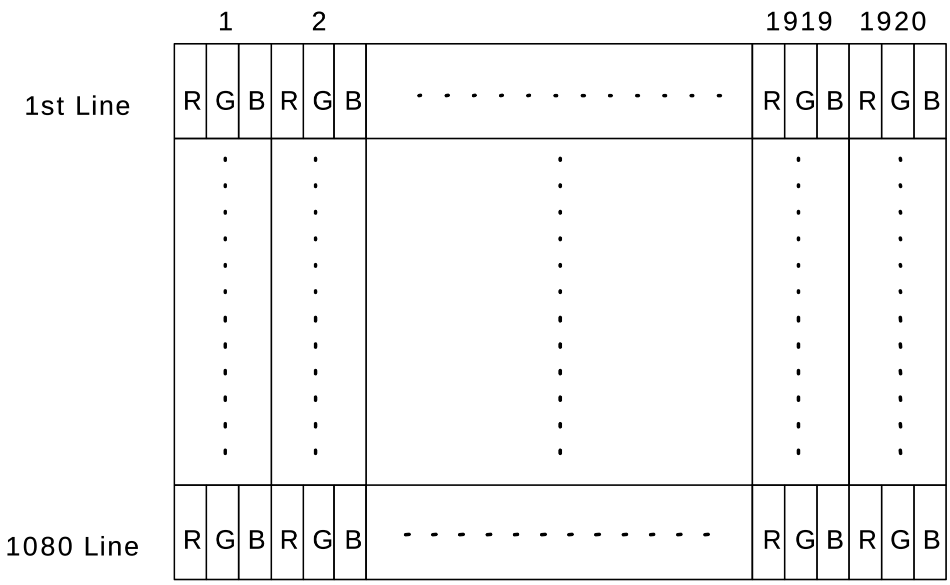
Note 6: The variance of CCFL power consumption is ±10%. (IRCFL × VCFL × 4 = PCFL)

Note 7: Definition of life time: brightness becomes 50%. The minimum life time of CCFL unit is on the condition of 7.5mA CCFL current and 25±2℃.

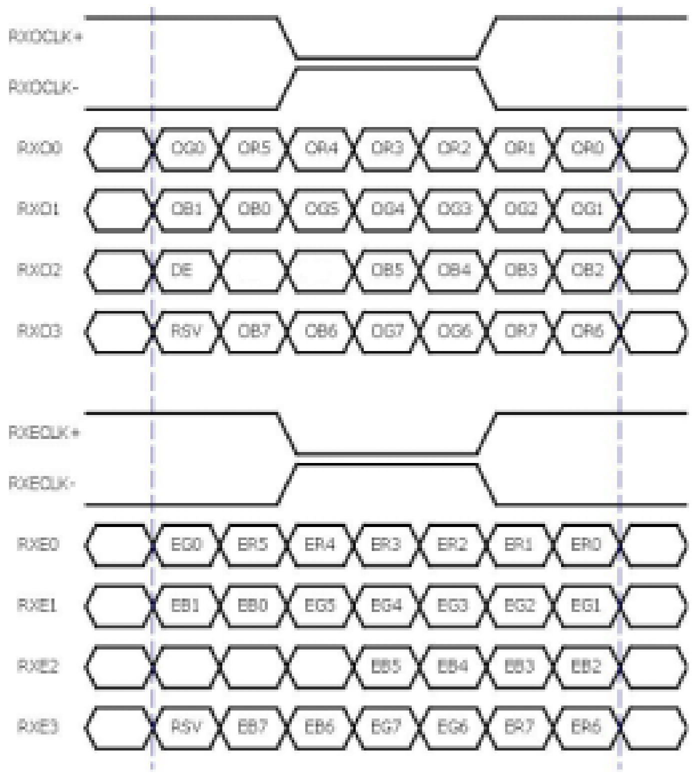
6.0 Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.



6.2 The input data format



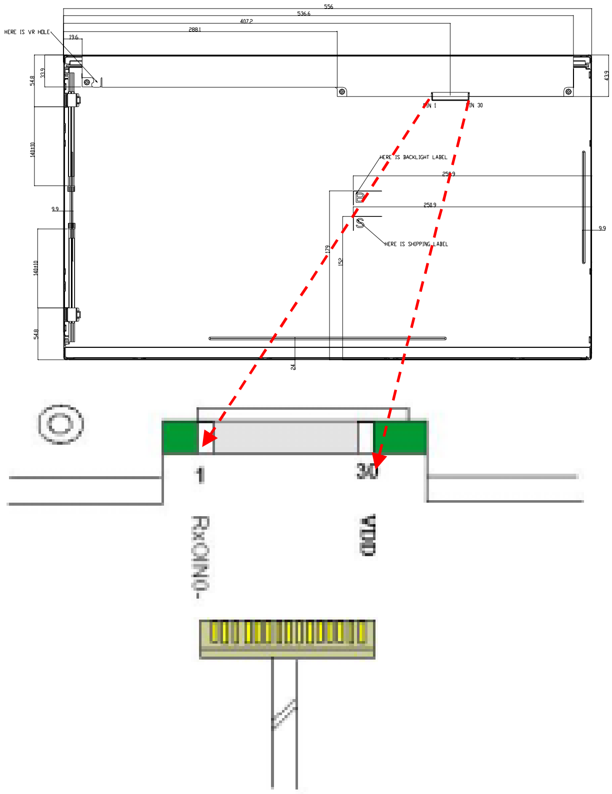
Note 1: R/G/B data 7:MSB, R/G/B data 0:LSB O = “Odd Pixel Data” E = “Even Pixel Data”

6.3 Signal Description

The module using one LVDS receiver SN75LVDS82(Texas Instruments). LVDS is a differential signal technology for LCD interface and high speed data transfer device. LVDS transmitters shall be SN75LVDS83(negative edge sampling). The first LVDS port(RxOxxx) transmits odd pixels while the second LVDS port(RxExxx) transmits even pixels.

PIN #	SIGNAL NAME	DESCRIPTION
1	RxOIN0-	Negative LVDS differential data input (Odd data)
2	RxOIN0+	Positive LVDS differential data input (Odd data)
3	RxOIN1-	Negative LVDS differential data input (Odd data)
4	RxOIN1+	Positive LVDS differential data input (Odd data)
5	RxOIN2-	Negative LVDS differential data input (Odd data, DSPTMG)
6	RxOIN2+	Positive LVDS differential data input (Odd data, DSPTMG)
7	GND	Power Ground
8	RxOCLK-	Negative LVDS differential clock input (Odd clock)
9	RxOCLK+	Positive LVDS differential clock input (Odd clock)
10	RxOIN3-	Negative LVDS differential data input (Odd data)
11	RxOIN3+	Positive LVDS differential data input (Odd data)
12	RxEIN0-	Negative LVDS differential data input (Even data)
13	RxEIN0+	Positive LVDS differential data input (Even data)
14	GND	Power Ground
15	RxEIN1-	Positive LVDS differential data input (Even data)
16	RxEIN1+	Negative LVDS differential data input (Even data)
17	GND	Power Ground
18	RxEIN2-	Negative LVDS differential data input (Even data)
19	RxEIN2+	Positive LVDS differential data input (Even data)
20	RxECLK-	Negative LVDS differential clock input (Even clock)
21	RxECLK+	Positive LVDS differential clock input (Even clock)
22	RxEIN3-	Negative LVDS differential data input (Even data)
23	RxEIN3+	Positive LVDS differential data input (Even data)
24	GND	Power Ground
25	NC	No connection (for AUO test only. Do not connect)
26	NC	No connection (for AUO test only. Do not connect)
27	VDD	Power +5V
28	VDD	Power +5V
29	VDD	Power +5V
30	VDD	Power +5V

Note1: Start from left side



Note2: Input signals of odd and even clock shall be the same timing.

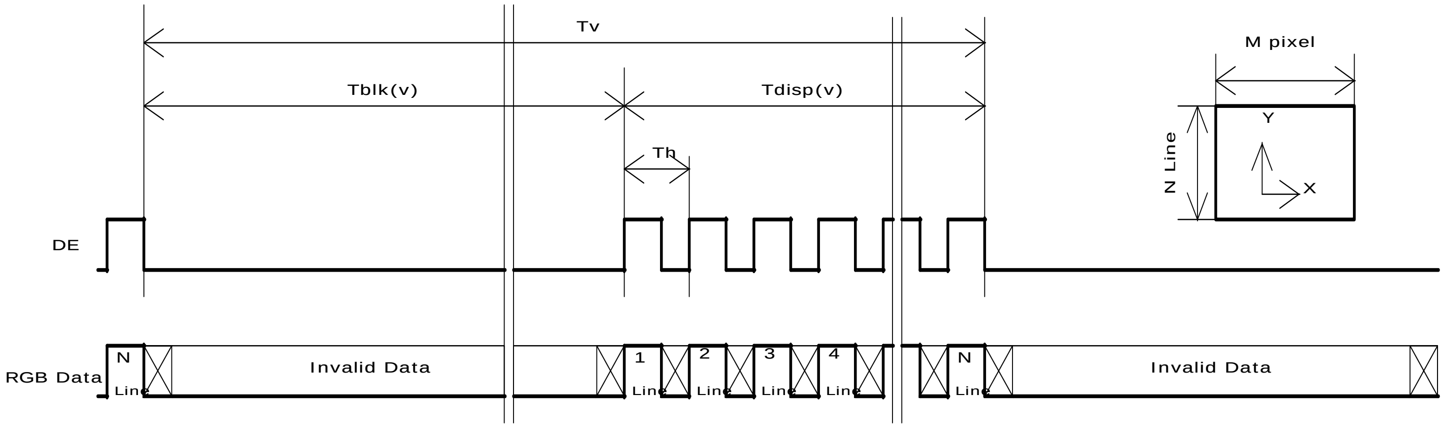
6.4 Timing Characteristics

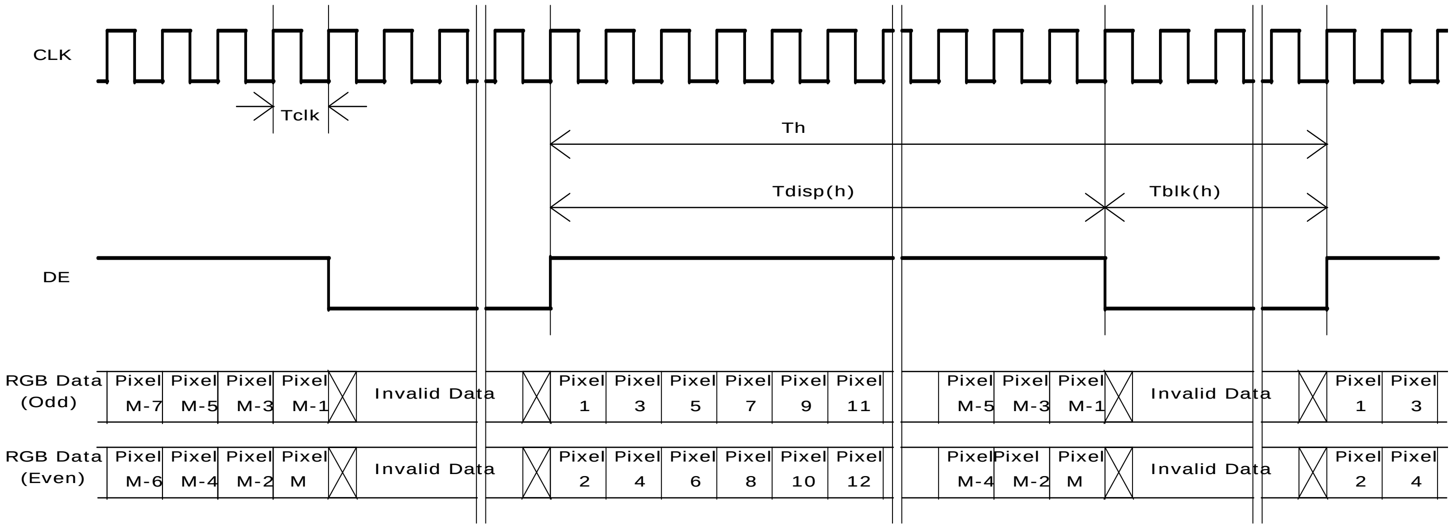
Basically, interface timing described here is not actual input timing of LCD module but close to output timing of SN75LVDS82DGG (Texas Instruments) or equivalent.

Item		Symbol	Min	Typ	Max	Unit
Data CLK		Tclk	40	75	90	[MHz]
H-section	Period	Th	1034	1060	2047	[Tclk]
	Display Area	Tdisp(h)	960	960	960	[Tclk]
	Blanking	Tblk(h)	74	100	1087	[Tclk]
V-section	Period	Tv	1088	1120	2047	[Th]
	Display Area	Tdisp(v)	1080	1080	1080	[Th]
	Blanking	Tblk(v)	8	40	967	[Th]
Frame Rate		F	50	60	75	[Hz]

Note : DE mode only

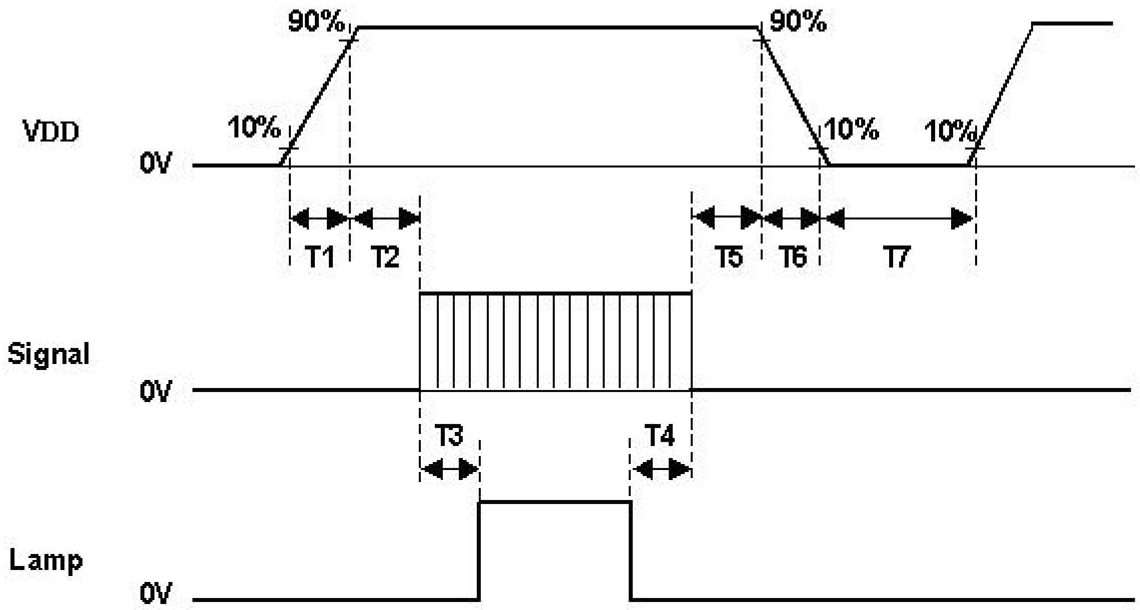
6.5 Timing diagram





6.6 Power ON/OFF Sequence

VDD power and lamp on/off sequence are as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	0.5	-	10	[msec]
T2	0	-	15	[msec]
T3	300	-	-	[msec]
T4	200	-	-	[msec]
T5	0	16	50	[msec]
T6	-	-	100	[msec]
T7	1000	-	-	[msec]

7.0 Connector & Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

7.1 TFT LCD Module

Connector Name / Designation	Interface Connector / Interface card
Manufacturer	STM JAE
Type Part Number	MSBKT2407P30HB FI-XB30SSL-HF15
Mating Housing Part Number	FI-X30HL (Locked Type)

7.1.1 Pin Assignment

Pin#	Signal Name	Pin#	Signal Name
1	RxOIN0-	2	RxOIN0+
3	RxOIN1-	4	RxOIN1+
5	RxOIN2-	6	RxOIN2+
7	GND	8	RxOCLKIN-
9	RxOCLKIN+	10	RxOIN3-
11	RxOIN3+	12	RxEIN0-
13	RxEIN0+	14	GND
15	RxEIN1-	16	RxEIN1+
17	GND	18	RxEIN2-
19	RxEIN2+	20	RxECLKIN-
21	RxECLKIN+	22	RxEIN3-
23	RxEIN3+	24	GND
25	NC (for AUO test only. Do not connect)	26	NC (for AUO test only. Do not connect)
27	VDD	28	VDD
29	VDD	30	VDD

7.2 Backlight Unit

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

Connector Name / Designation	Lamp Connector / Backlight lamp
Manufacturer	CVILUX
Type Part Number	CP0502SL090
Mating Type Part Number	CP0502P1ML0

7.2.1 Signal for Lamp connector

	Connector No.	Pin No.	Input	Color	Function
Upper	CN1	1	Hot1	Pink	High Voltage
		2	Cold1	White	Low Voltage
	CN2	1	Hot2	Blue	High Voltage
		2	Cold2	Black	Low Voltage

	Connector No.	Pin No.	Input	Color	Function
Lower	CN3	1	Hot1	Pink	High Voltage
		2	Cold1	White	Low Voltage
	CN4	1	Hot2	Blue	High Voltage
		2	Cold2	Black	Low Voltage

8.0 Reliability Test

Environment test conditions are listed as following table.

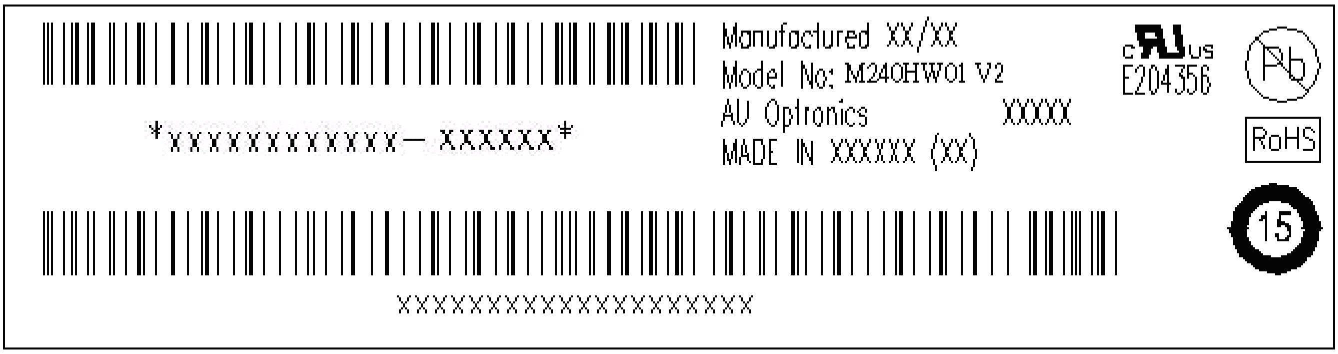
Items	Required Condition	Note
Temperature Humidity Bias (THB)	Ta= 50℃, 80%RH, 300hours	
High Temperature Operation (HTO)	Ta= 50℃, 50%RH, 300hours	
Low Temperature Operation (LTO)	Ta= 0℃, 300hours	
High Temperature Storage (HTS)	Ta= 60℃, 300hours	
Low Temperature Storage (LTS)	Ta= -20℃, 300hours	
Vibration Test (Non-operation)	Acceleration: 1.5 Grms Wave: Random Frequency: 10 - 200 Hz Duration: 30 Minutes each Axis (X, Y, Z)	
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction: ±X, ±Y, ±Z (one time for each Axis)	
Drop Test	Height: 46 cm, package test	
Thermal Shock Test (TST)	-20℃/30min, 60℃/30min, 100 cycles	***1***
On/Off Test	On/10sec, Off/10sec, 30,000 cycles	
ESD (Electro Static Discharge)	Contact Discharge: ± 8KV, 150pF(330Ω) 1sec, 15 points, 25 times/ point.	***2***
	Air Discharge: ± 15KV, 150pF(330Ω) 1sec 15 points, 25 times/ point.	
Altitude Test	Operation:10,000 ft Non-Operation:30,000 ft	

Note 1: The TFT-LCD module will not sustain damage after being subjected to 100 cycles of rapid temperature change. A cycle of rapid temperature change consists of varying the temperature from -20℃ to 60℃, and back again. Power is not applied during the test. After temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

Note 2: EN61000-4-2, ESD class B: Certain performance degradation allowed
No data lost
Self-recoverable
No hardware failures.

9.0 Shipping Label

The label is on the panel as shown below:



Note 1: For Pb Free products, AUO will add for identification.

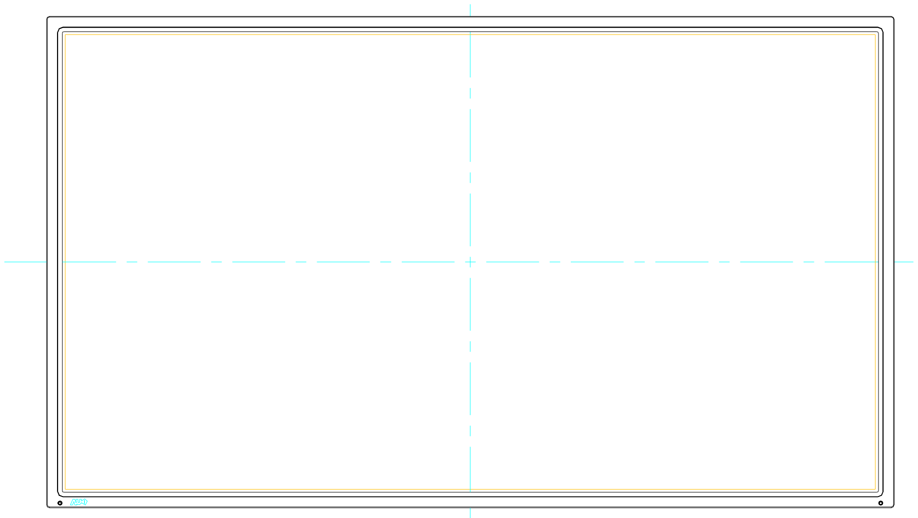
Note 2: For RoHS compatible products, AUO will add for identification.

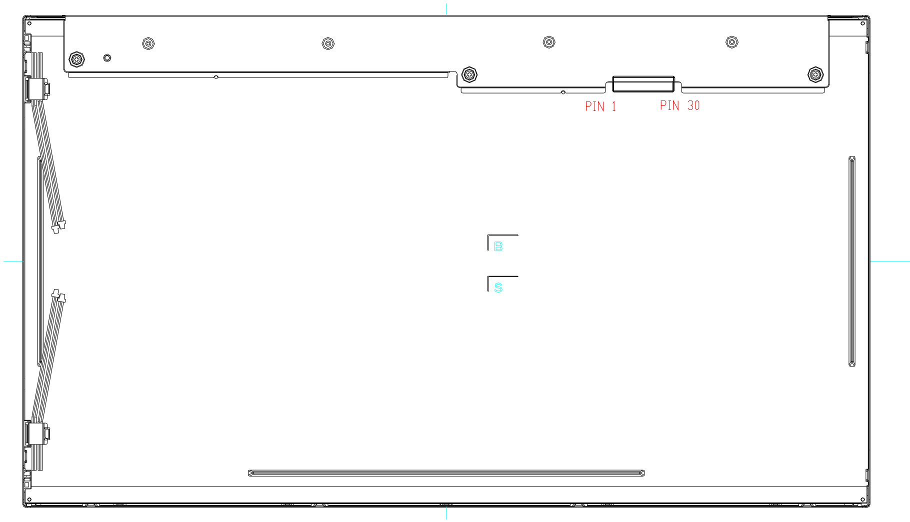
Note 3: For China RoHS compatible products, AUO will add for identification.

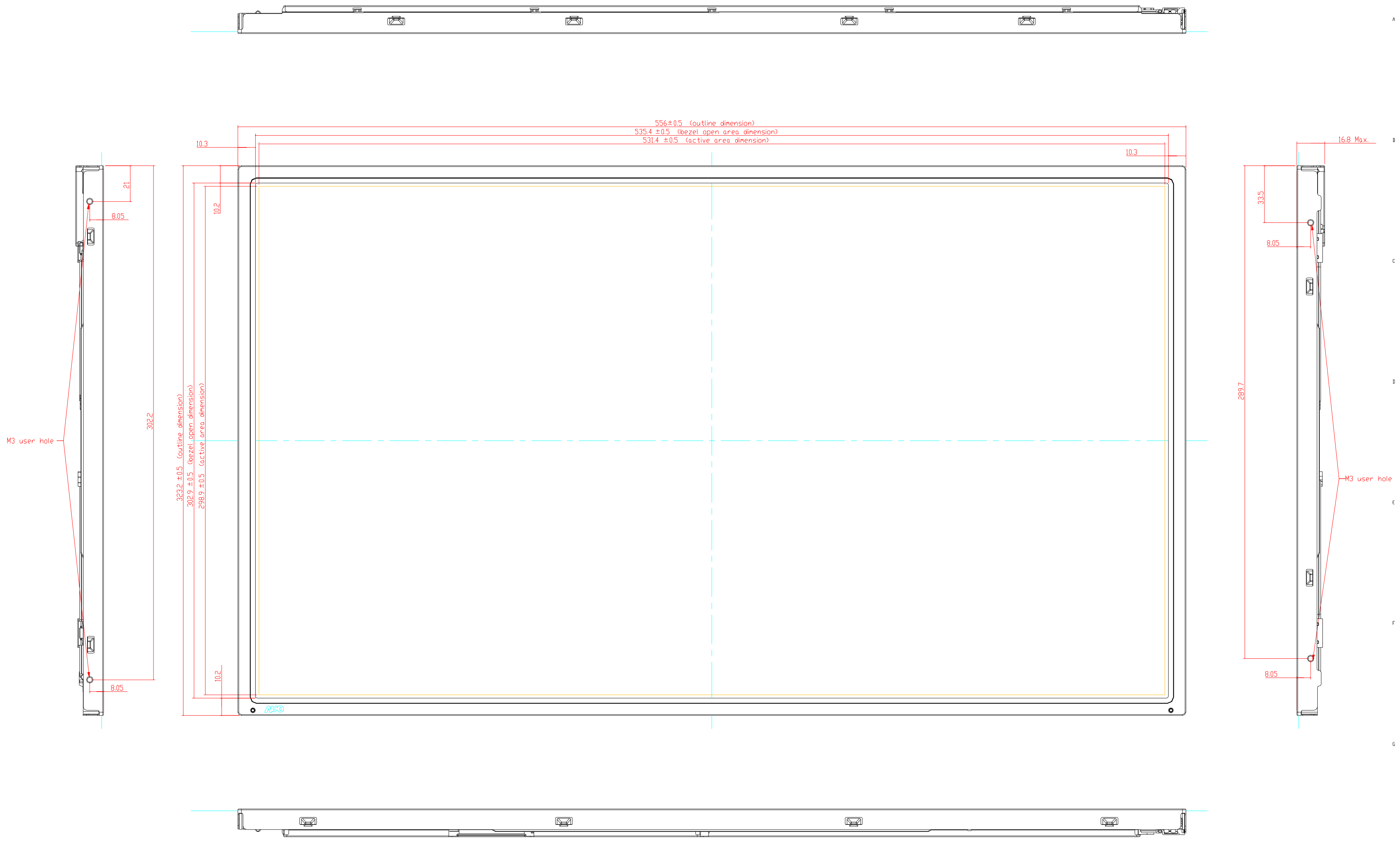
Note 4: The Green Mark will be presented only when the green documents have been ready by AUO Internal Green Team.

10.0 Mechanical Characteristics

NOTE:
1.PRELIMINARY DRAWING FOR REFERENCE ONLY.
2.THE DIMENSION EXCLUDES DEFORMATION.
3.MODULE THICKNESS TO BE 16.8mm MAX.
4.UNSPECIFIED TOLERANCE MUST FOLLOW TOLERANCE TABLE.
5.LAMP CABLE CONNECTOR TO BE CVILUX CP0502SL090 OR AUO APPROVED.
6.I/F CONNECTOR TO BE STM MSBKT2407P30HB OR AU APPROVED.
7.M3 USER HOLE SCREW TORQUE 4.0kgf-cm MAX.
8.USER HOLE SCREW PENETRATION 4.5mm MAX.

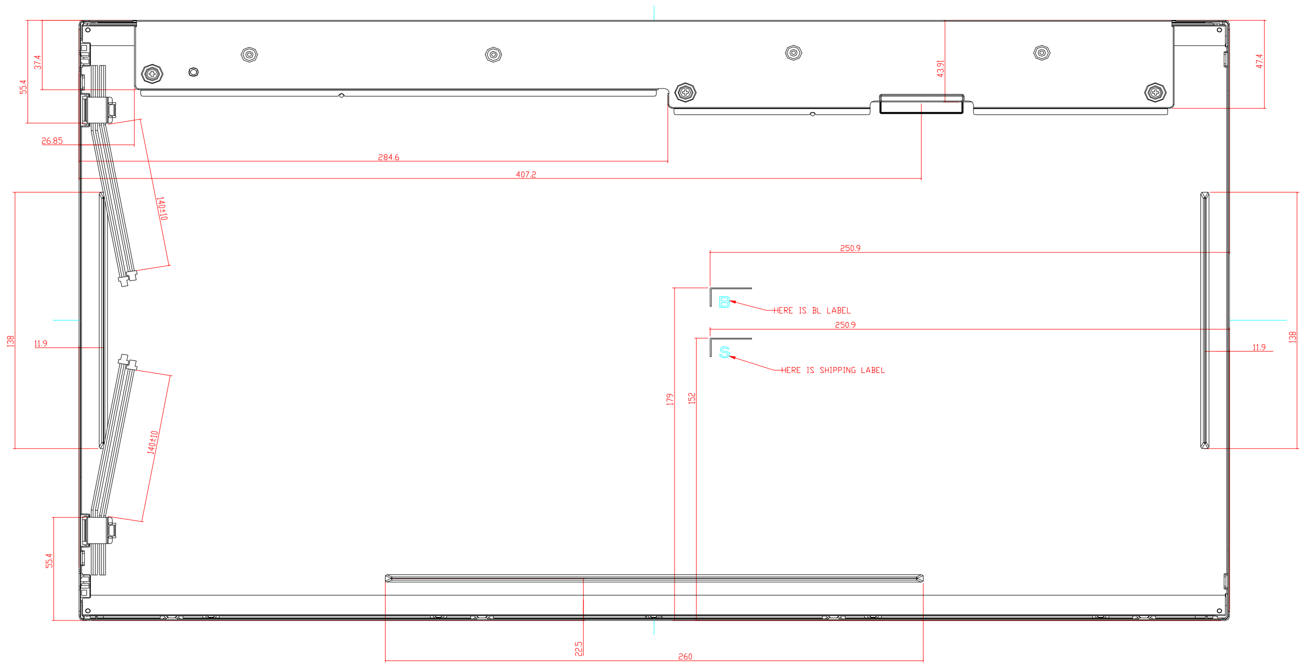






556±0.5 (outline dimension)
535.4 ±0.5 (bezel open area dimension)
531.4 ±0.5 (active area dimension)
10.3
10.3
16.8 Max.
21
8.05
33.5
8.05
M3 user hole
302.2
323.2 ±0.5 (outline dimension)
302.9 ±0.5 (bezel open area dimension)
298.9 ±0.5 (active area dimension)
10.2
10.2
289.7
M3 user hole
8.05
8.05

Ver 0.2



HERE IS BL LABEL
HERE IS SHIPPING LABEL
284.6
407.2
250.9
250.9
260
22.5
179
152
138
138
11.9
11.9
55.4
55.4
37.4
26.85
43.91
47.4
140±10
140±10

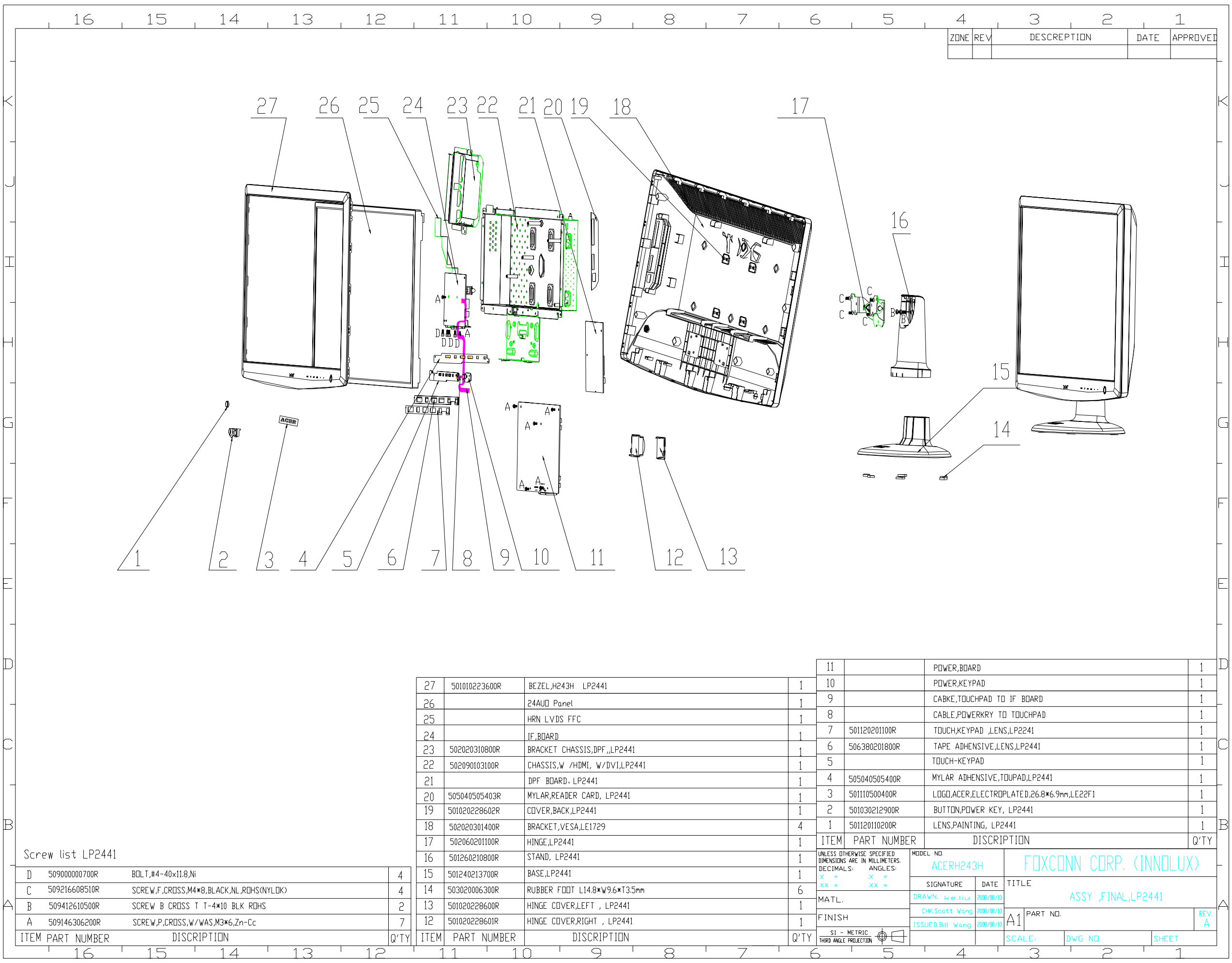
Ver 0.2

03 Exploded Diagram

3.1 D240H_SCREW_LIST

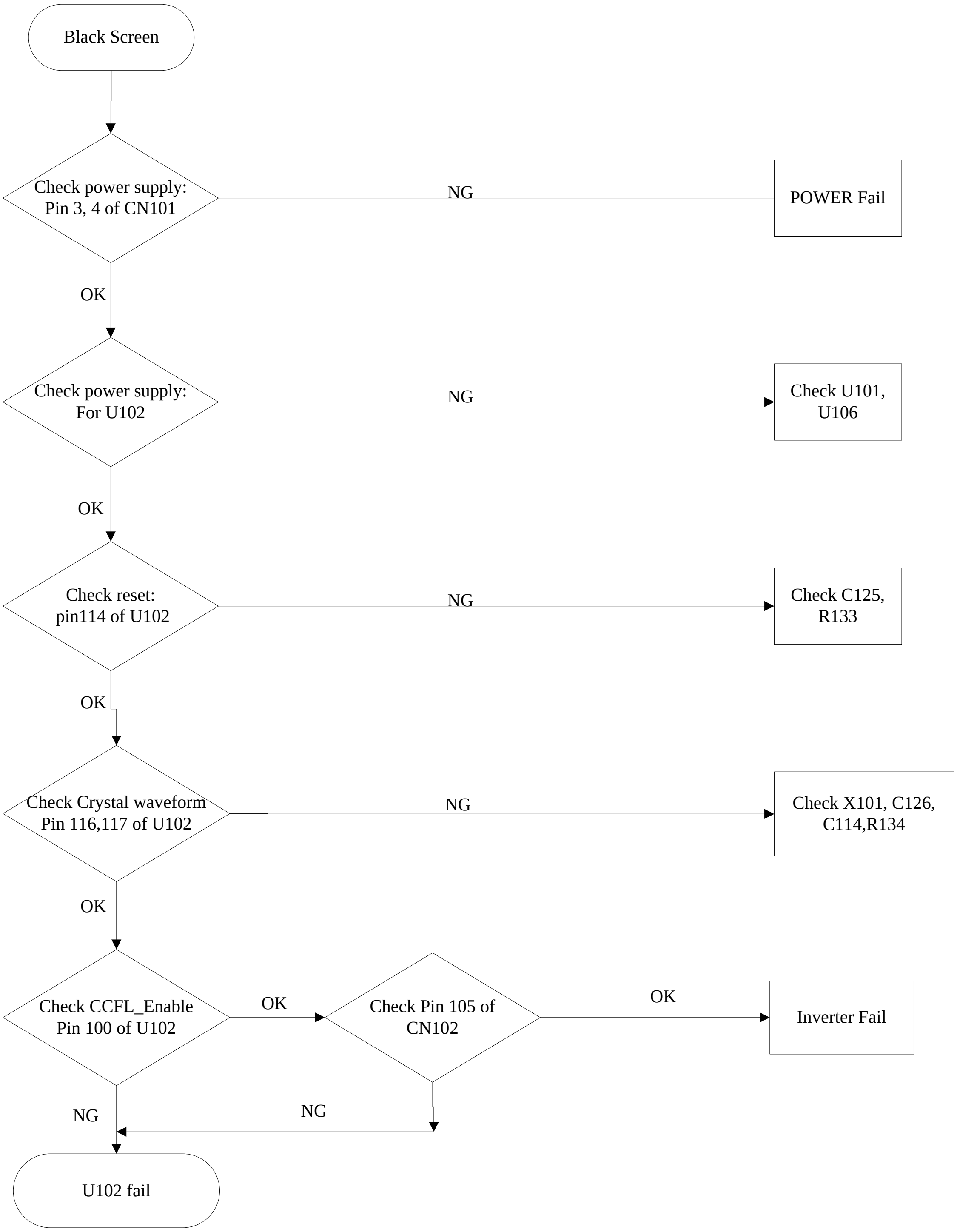
ITEM	PN	Description	Q'TY(PCS)	Fixed T(kg*cm)	Remark
1	509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	10	6.5±0.5	For NVBD/PWRBD/HDMI
2	509216608110R	SCREW,F,CROSS,M4*8,BLACK,NL,ROHS(NYLOK)	4	12±1	For Hingle toBack cover
3	509412610500R	SCREW B CROSS T T-4*10 BLK ROHS	3	9.5±0.5	For Hingle to Stand Front
4	509000000700R	BOLT,#4-40x11.8,Ni	4	4.0±0.25	For D-SUB CON&DVI

3.2. LCD Exploded drawing (All)

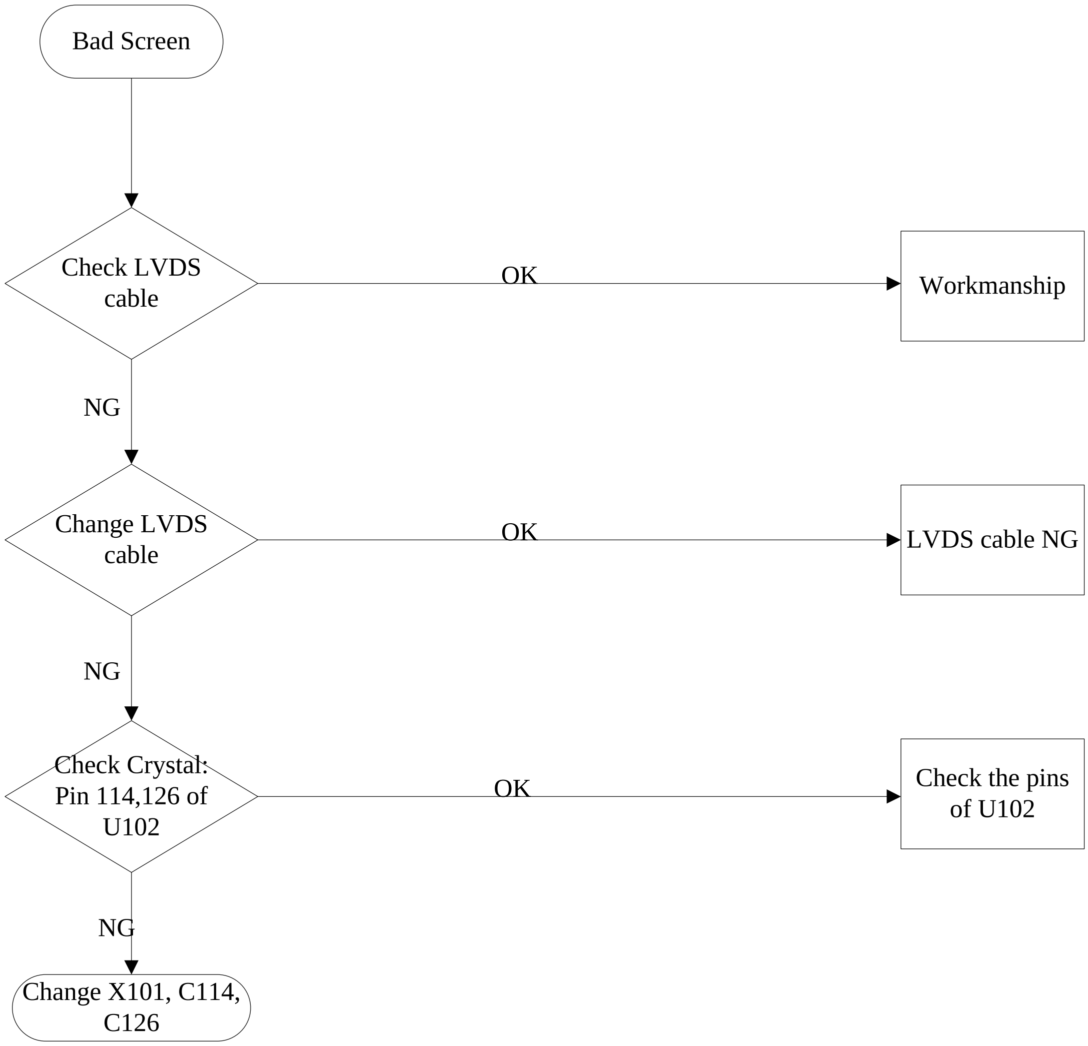


04 Troubleshooting

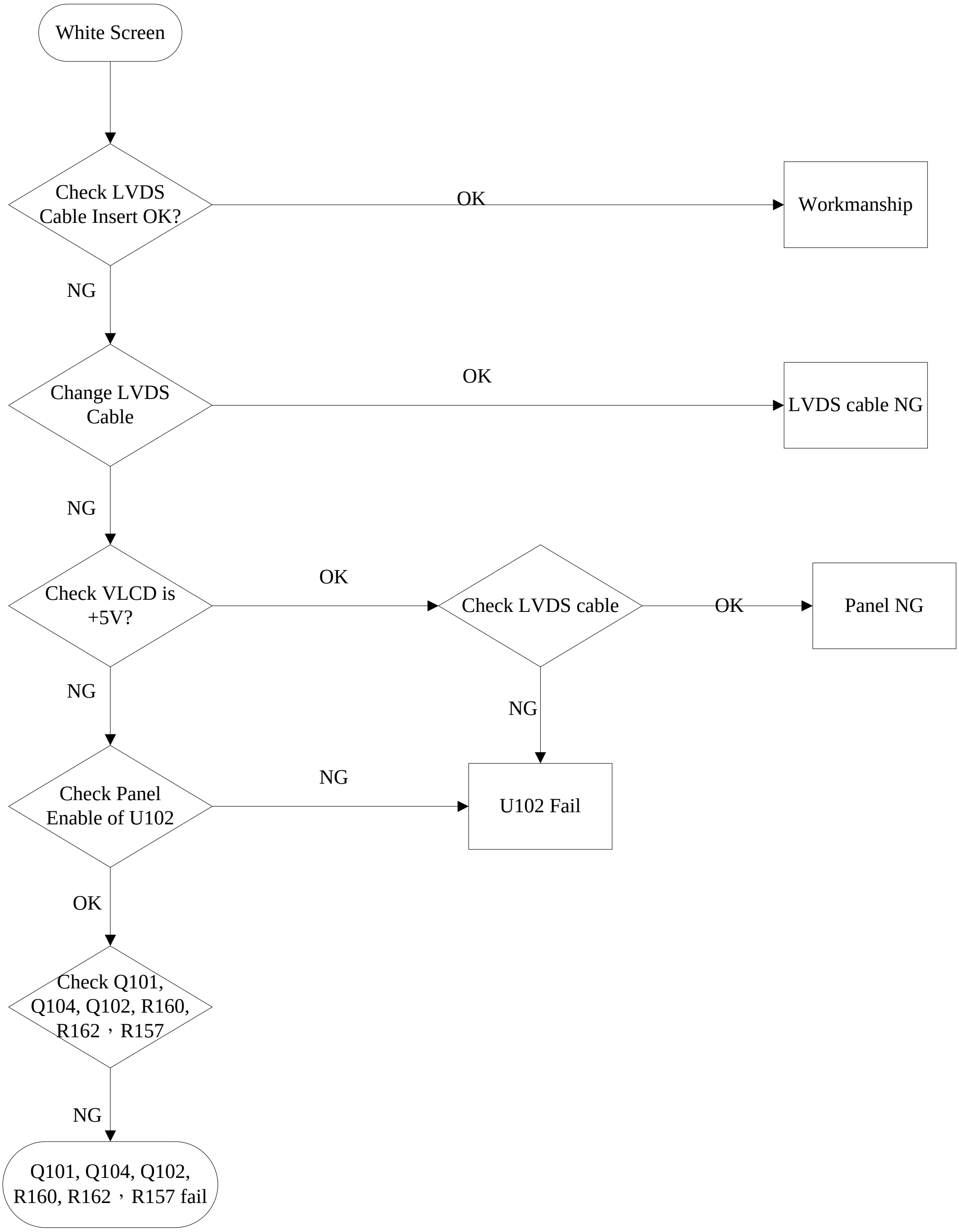
4.1 Black Sreen



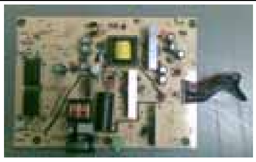
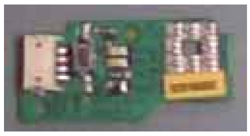
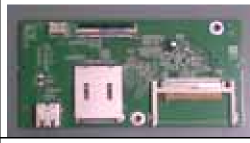
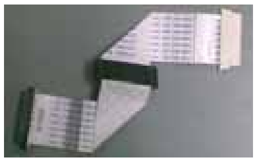
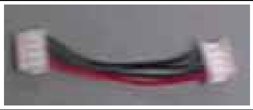
4.2 Bad Screen

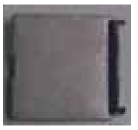
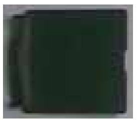


4.3 White Sreen



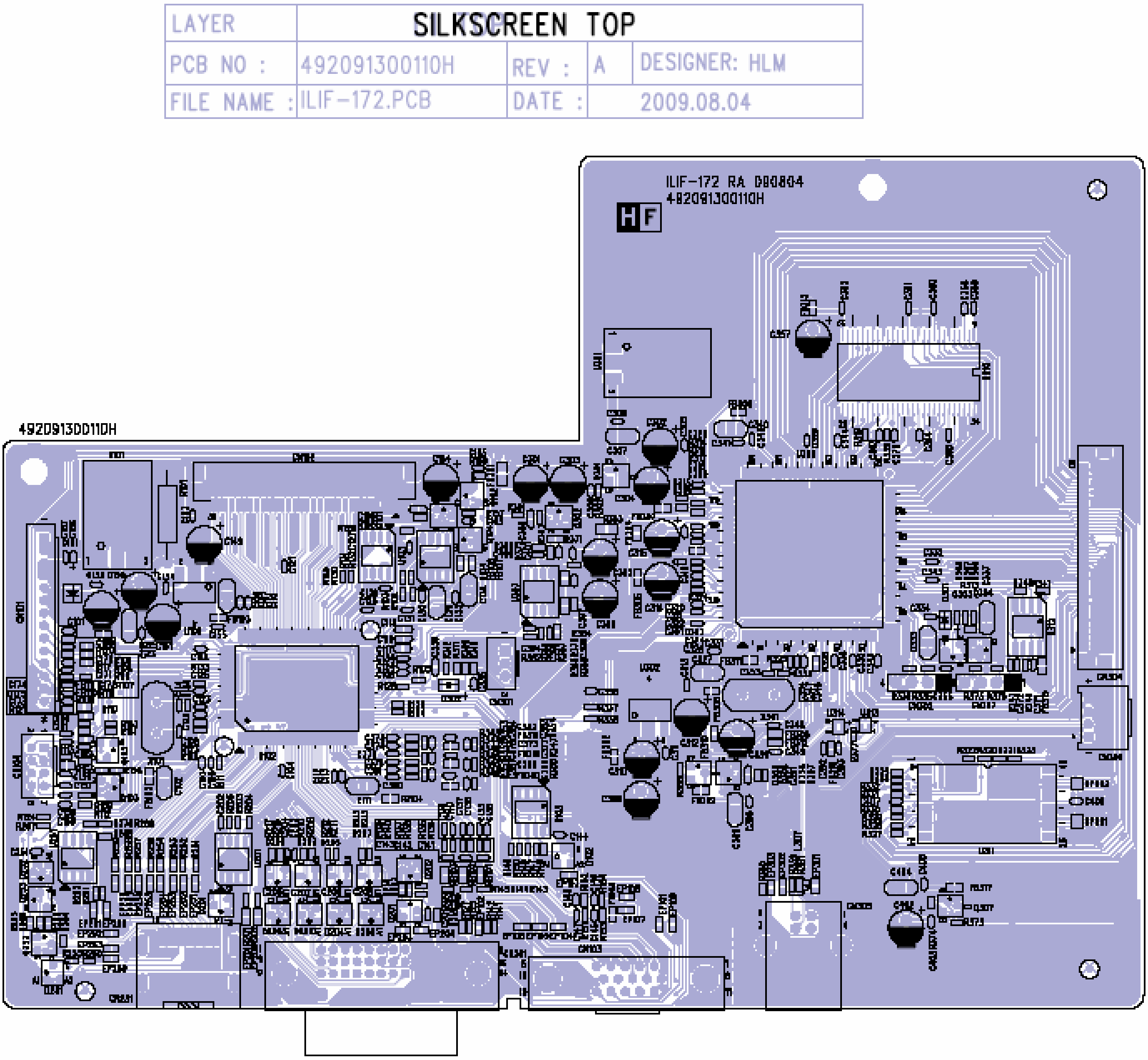
05 Spare parts List

ACER PART NO.	OEM PART NO	DESCRIPTION	82424173A120R
			CN
55.LJR0J.001	792381300720H	PCBA,IF/B(V2,W/SPK,EMEA),LP2441-737	
55.LJR0J.002	792381400710H	PCBA,PI/B,W/SPK,LP2441-737	
55.LEW0J.003	792381500000R	PCBA,POWER KEYPAD/B,LP2441 ROHS	
55.LEW0J.004	792381500010R	PCBA,TOUCHPAD BOARD,LP2441 ROHS	
55.LJR0J.003	792382400700H	PCBA,CARD BOARD,LP2441-737	
50.LEW0J.002	430303002230R	HRN LVDS FFC 30P 166.5mm W/TASTE	
50.LEW0J.003	430300400390R	HRN ASS'Y 4P 27MM UL1571#28	
50.LE40J.001	430300802060R	HRN ASSY, 2X4P TO 1X8P ,220mm,UL1571#28	
50.LJR0J.001	430303003060R	HRN LVDS FFC 30P 190mm W/CORE&TASTE	
50.LJR0J.002	430306000010R	HRN FFC 60P 50mm 0.5Pitch W/TASTE	
27.LBN0J.001	453070801190R	PWRCORD 16A/250V BLK 6FT VDE/KTL H05VV-F	
50.LA10J.003	453030300370R	CABLE,DVI-D 18+1P MALE 6FT BLACK , ROHS	
50.LBQ0J.001	453010100380R	CABLE,D-SUB 15P MALE 6FT BLACK/BLUE, ROH	
50.L63VF.003	453030300120R	CABLE AUDIO 1P 6FT BLACK/GREEN CP03B06P0	
60.LJR0J.001	714050021202R	ASSY,BACKCOVER,DPF,LP2441	

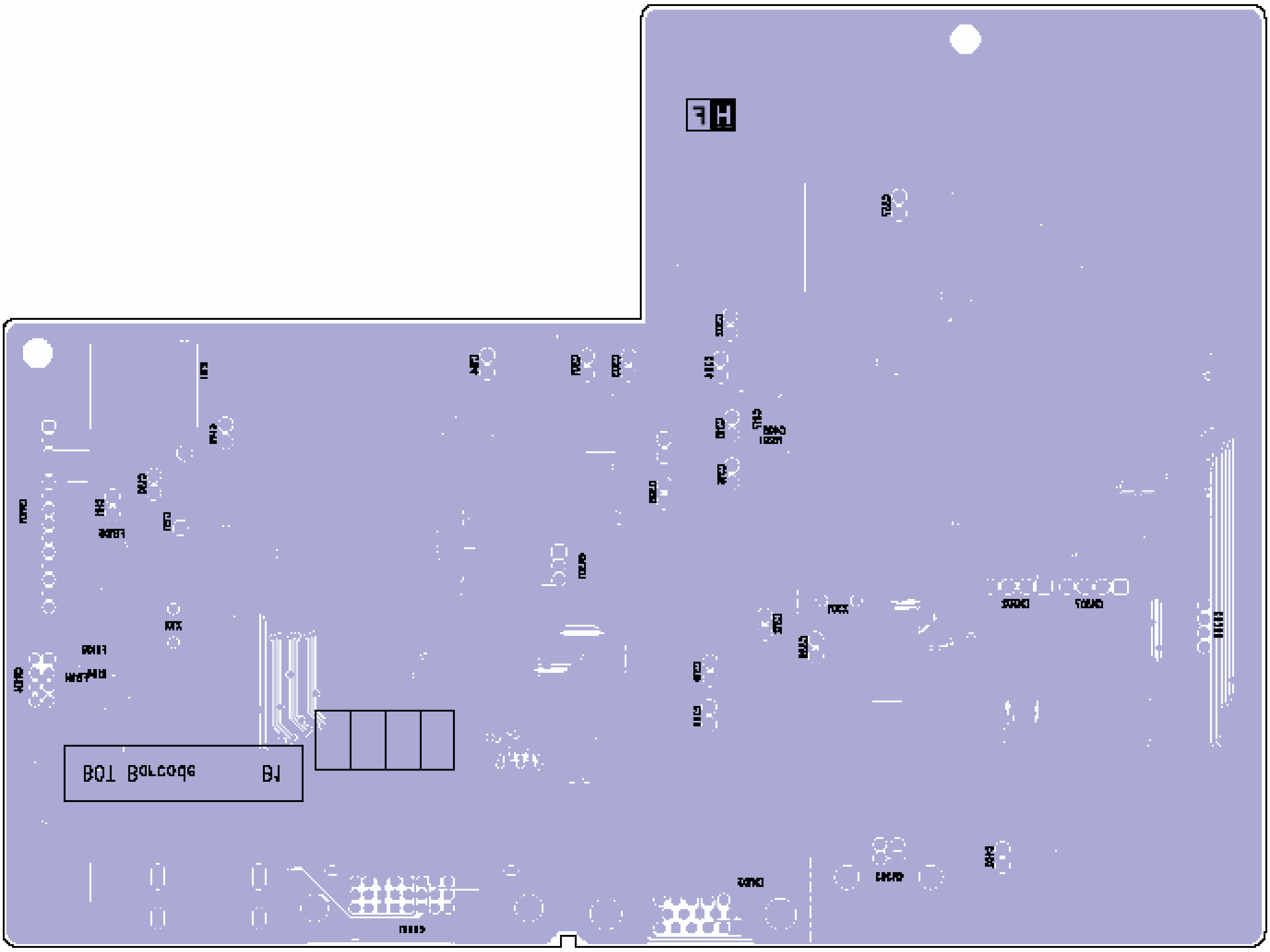
60.LEW0J.002	714030022100R	ASSY BEZEL ,LP2441	
60.LEW0J.003	714011206200R	ASSY STAND ,LP2441	
60.LEW0J.004	714020018200R	ASSY BASE,LP2441	
60.LJR0J.002	701000018401R	ASSY CHASSIS,DPF,LP2441	
60.LEW0J.005	501020228600R	HINGE COVER,LEFT , LP2441	
60.LEW0J.006	501020228601R	HINGE COVER,RIGHT , LP2441	
23.LFV0J.001	618100200430R	SPEAKER 2.5W4Ω 230mm&210mm R/G/B W/CASE	
LK.24005.019	631102240240H	LCP 24"M240HW01-V2-00(A)(AUO)HF	
LK.24005.019	631102240250H	LCP 24"M240HW01-V2-0A(A)(AUO)HF	

06 Schematics and Layouts

6.1 IF BD Layout

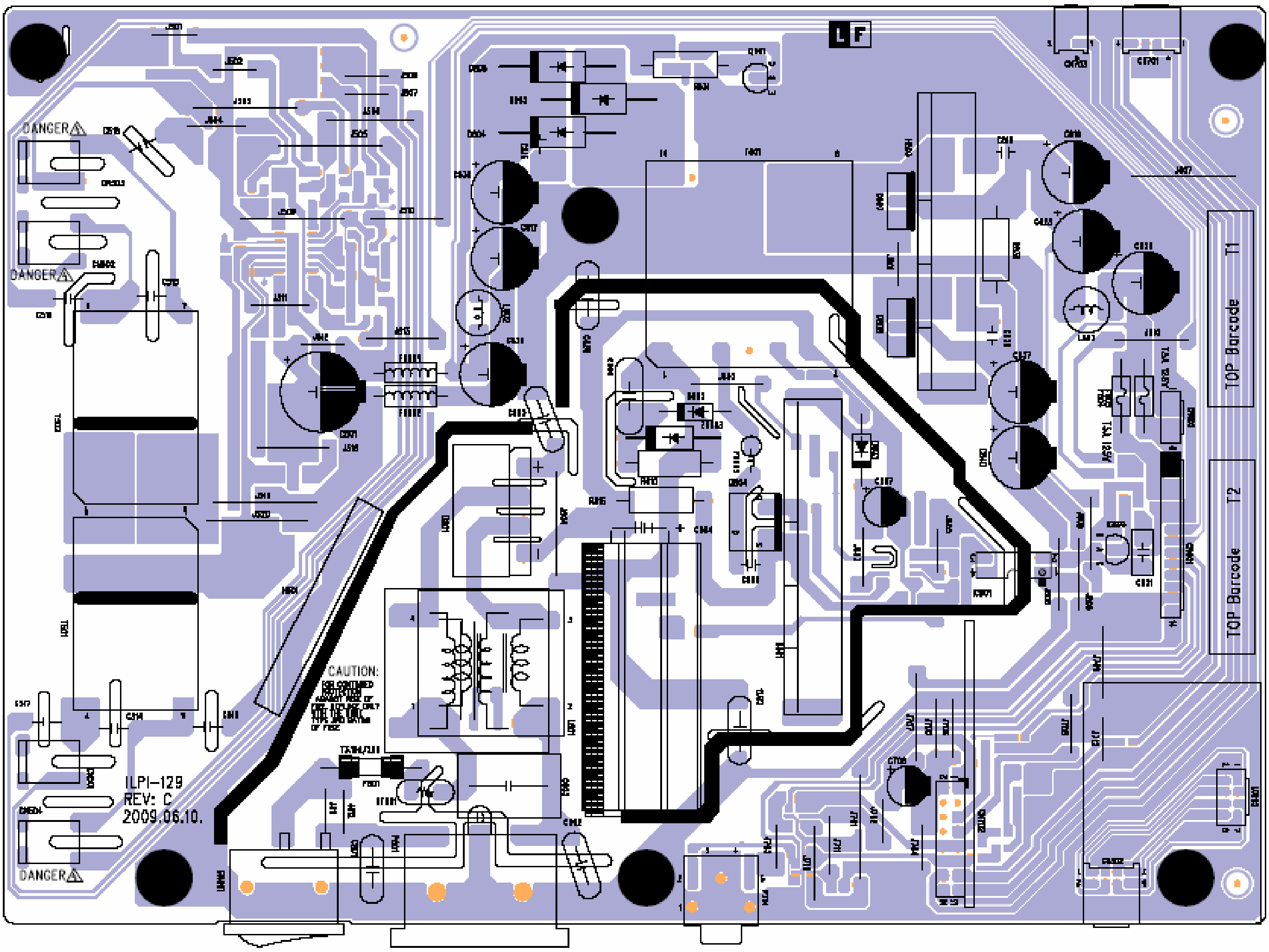


LAYER	SILKSCREEN BOTTOM			
PCB NO :	492091300110H	REV :	A	DESIGNER: HLM
FILE NAME :	ILIF-172.PCB	DATE :		2009.08.04

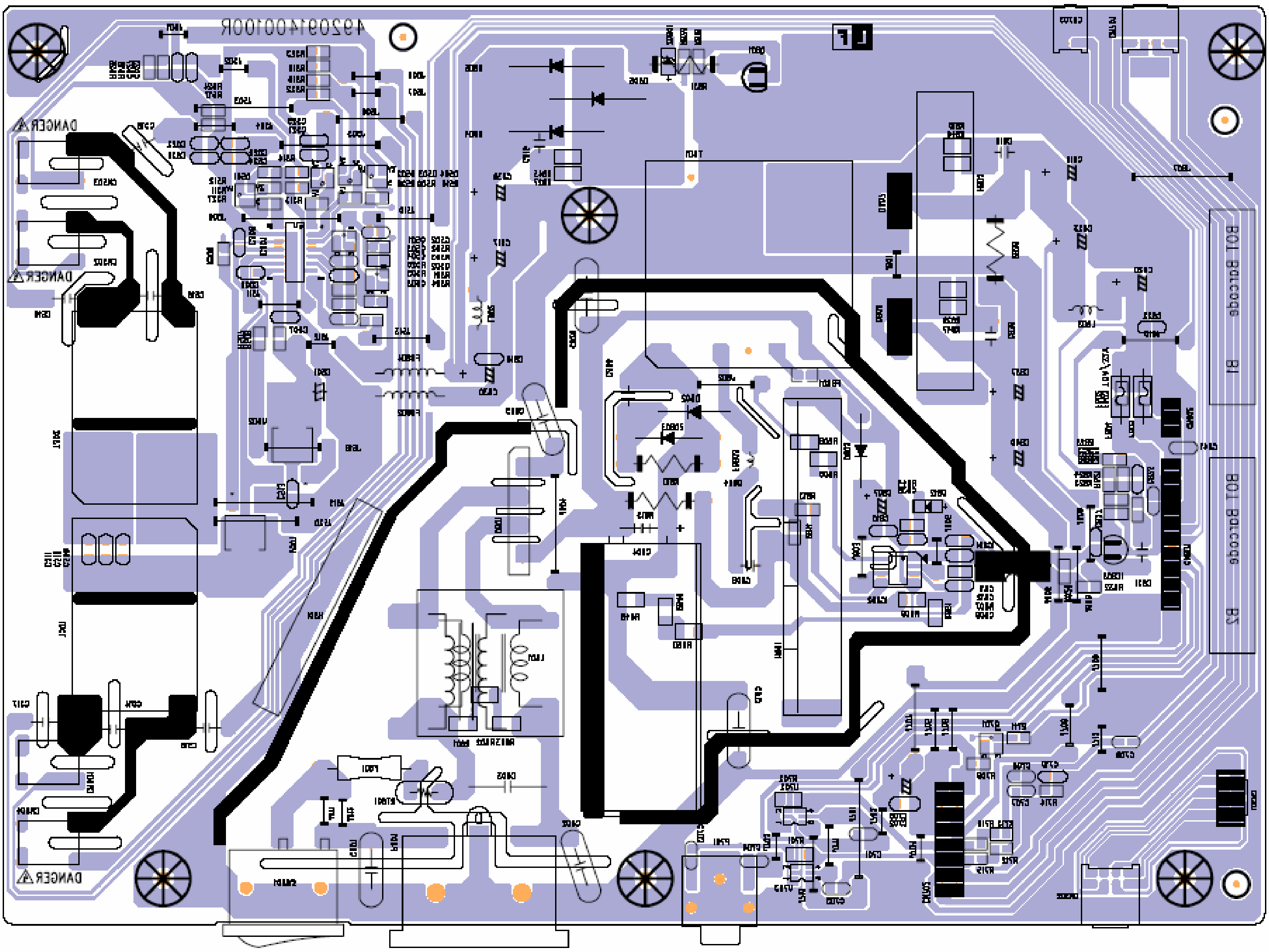


6.2 Power BD Layout

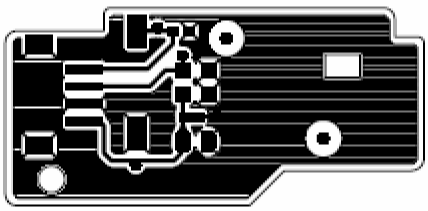
LAYER	SILKSCREEN TOP			
PCB NO :	492091400100R	REV :	C	DESIGNER: HUA LIU
FILE NAME :	ILPI-129	DATE :		2009.06.10.



LAYER	SILKSCREEN BOTTOM			
PCB NO :	492091400100R	REV :	C	DESIGNER: HUA LIU
FILE NAME :	ILPI-129	DATE :		2009.06.10.

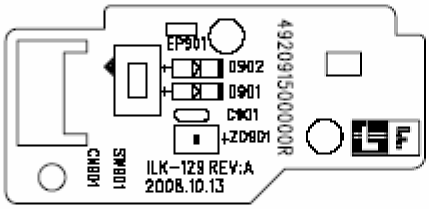


6.3 Keypad BD Layout



492091500000R

LAYER	L1 TOP			
PCB NO :	ILK-129	REV :	A	DESIGNER:ChenSX
FILE NAME :	ILK-129.PCB	DATE :		2008.10.13

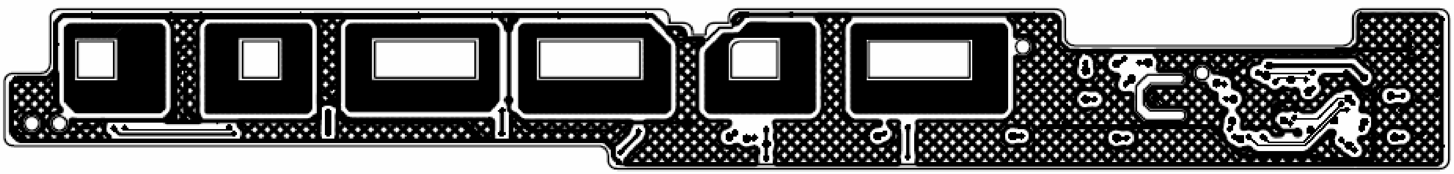


492091500000R

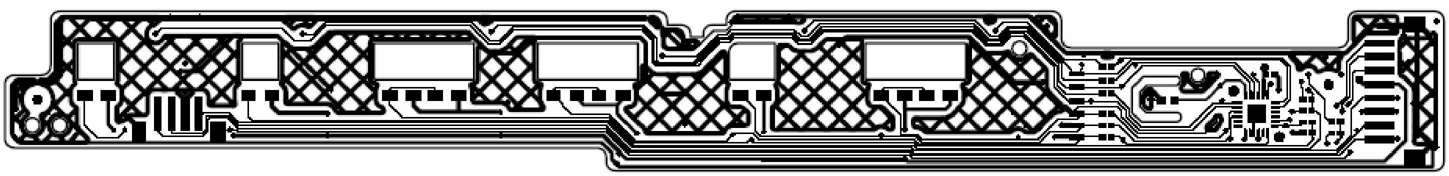
LAYER	SILKSCREEN TOP			
PCB NO :	ILK-129	REV :	A	DESIGNER:ChenSX
FILE NAME :	ILK-129.PCB	DATE :	2008.10.13	

6.4 Touchpad BD Layout

LAYER	L2 BOTTOM			
PCB NO :	ILK-126	REV :	C	DESIGNER: Song Wen
FILE NAME :	492091500010R	DATE :	2009.04.09	

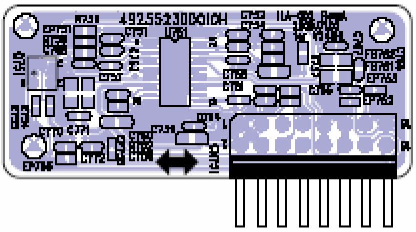


LAYER	L1 TOP			
PCB NO :	ILK-126	REV :	C	DESIGNER: Song Wen
FILE NAME :	492091500010R	DATE :	2009.04.09	

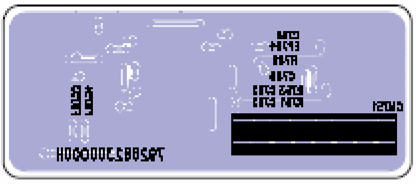


6.5 Card BD Layout

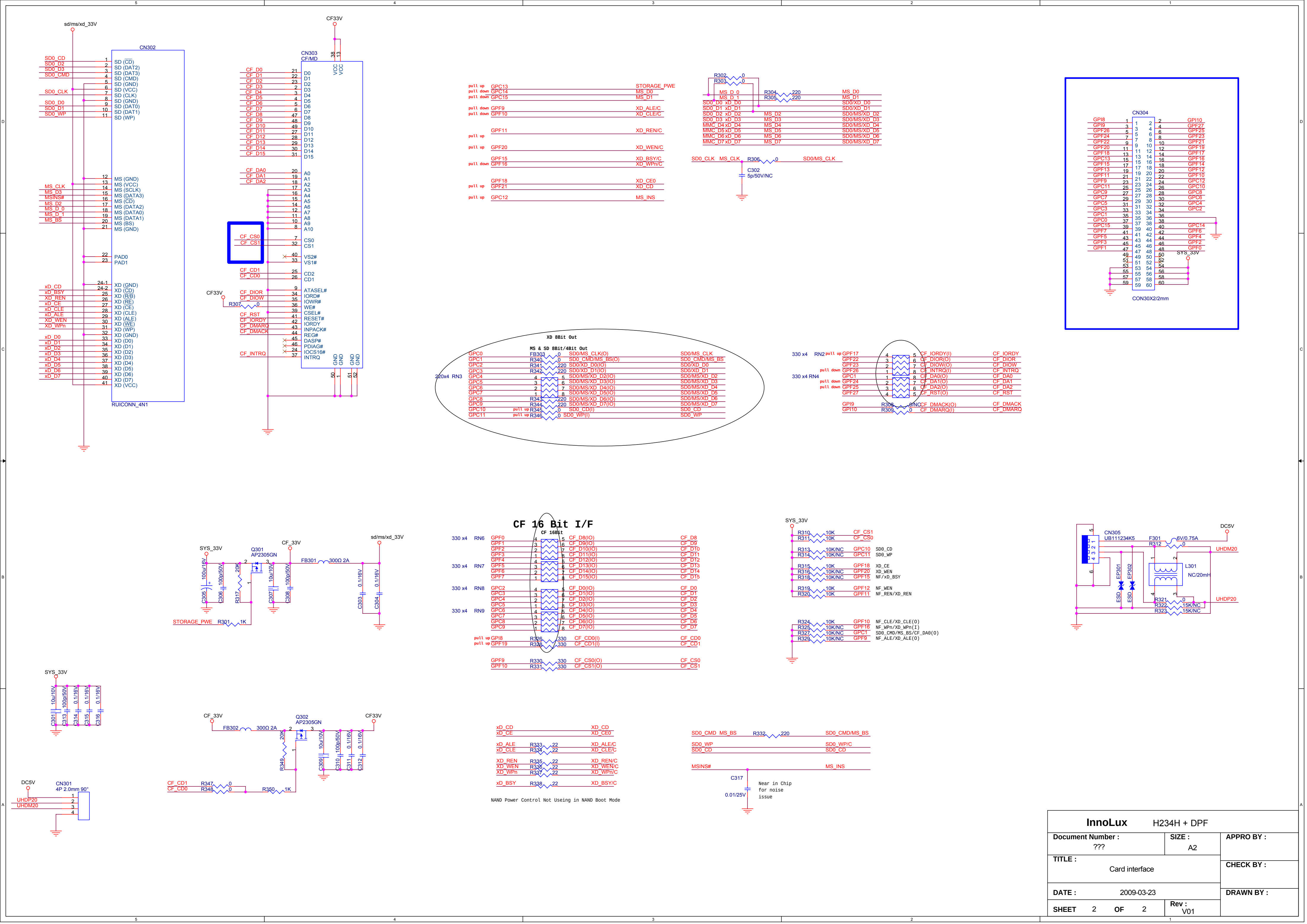
LAYER	SILKSCREEN TOP			
PCB NO :	492552300010H	REV :	A	DESIGNER:HLM
FILE NAME :	ILA-002.PCB	DATE :		2009.01.03



LAYER	SILKSCREEN BOTTOM			
PCB NO :	492552300010H	REV :	A	DESIGNER:HLM
FILE NAME :	ILA-002.PCB	DATE :		2009.01.03



6.5 Switching Mode Power Supply circuit



InnoLux H234H + DPF

Document Number : ???	SIZE : A2	APPRO BY :
TITLE : Card interface		CHECK BY :
DATE : 2009-03-23		DRAWN BY :
SHEET 2 OF 2	Rev : V01	

07 Assembly and Disassembly

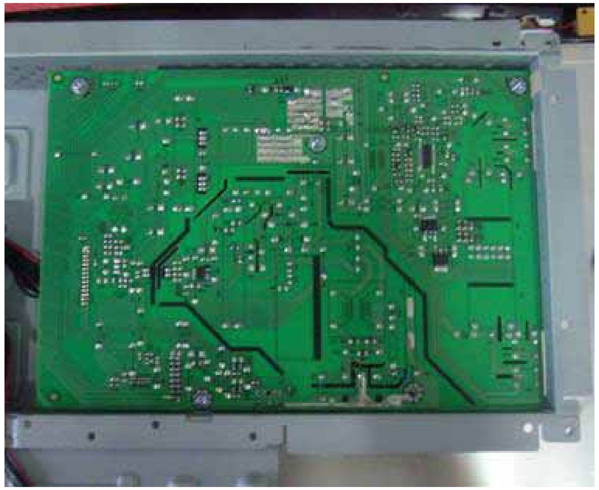
S1: Take out a panel



S2: Assemble the panel and the bezel.



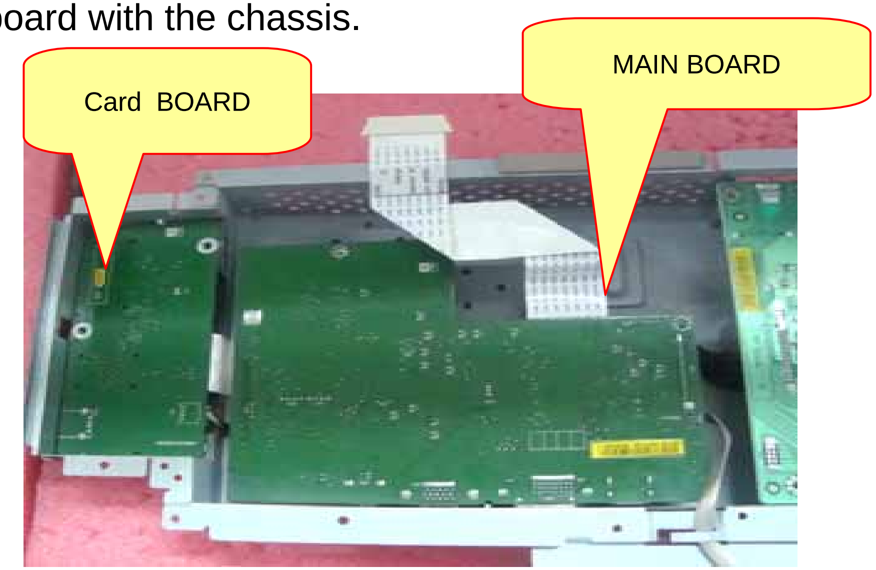
S3: Take out a chassis on the panel and assemble the power board and the chassis



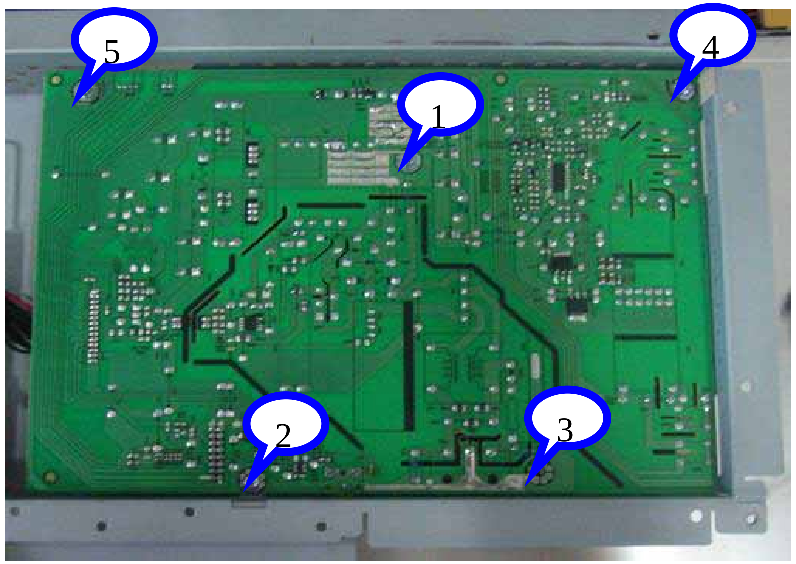
S4: Take out the main board and insert the FFC cable and keypad cable.



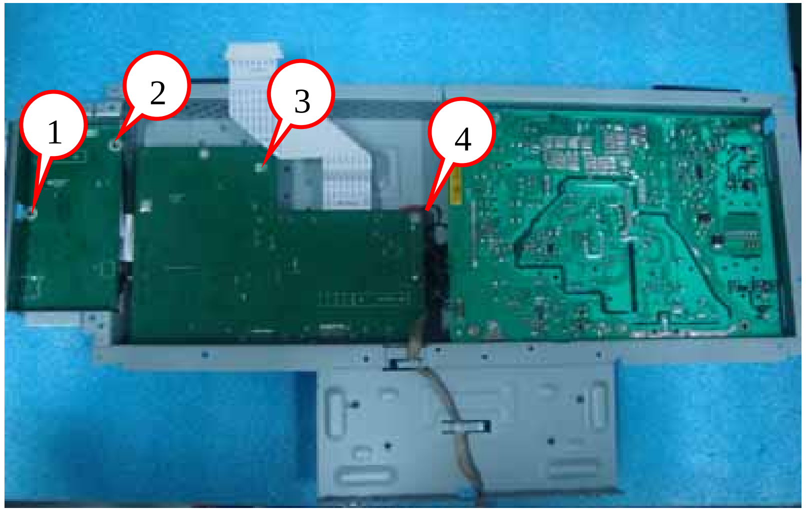
S5: Assemble the main board and the Card board with the chassis.



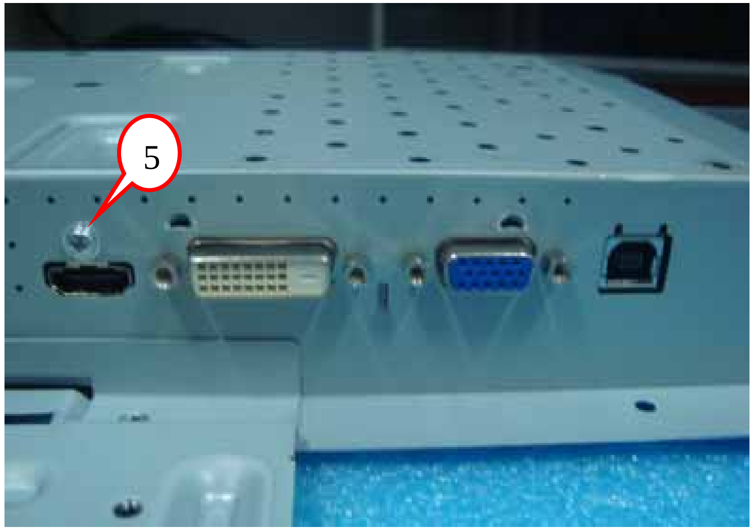
S6: Use a screwdriver to screw the 5 screws to fix the power board.



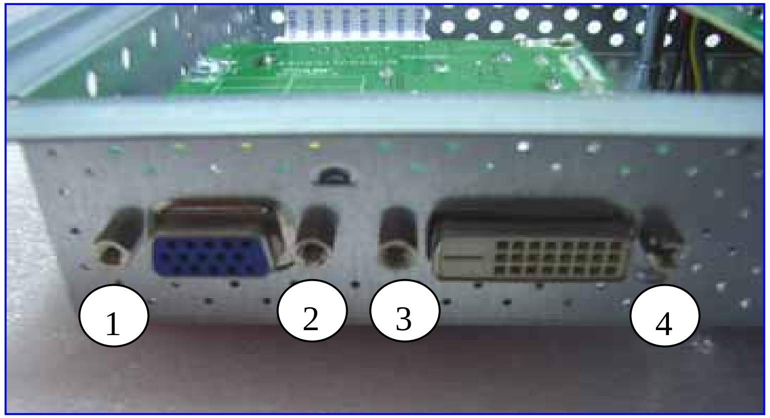
S7: Use a screwdriver to screw the 4 screws to fix the main board and USB board.



S8: Use a screwdriver to screw the 1 screw to fix the HDMI connecter.



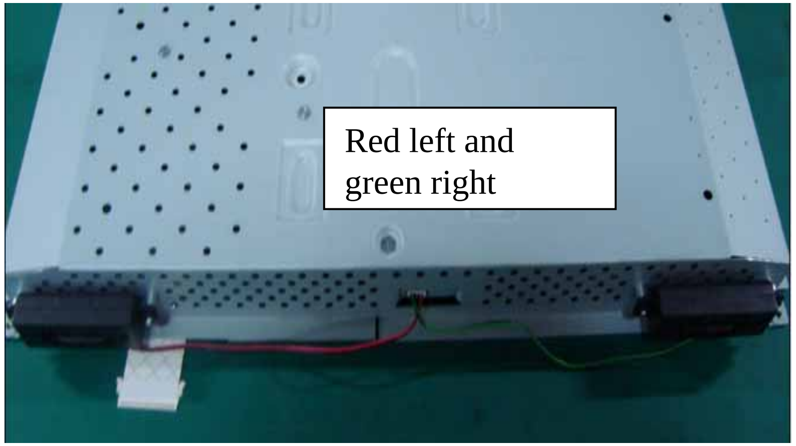
S9: Use a screwdriver to screw the 4 screws to fix the VGA and DVI connecter.



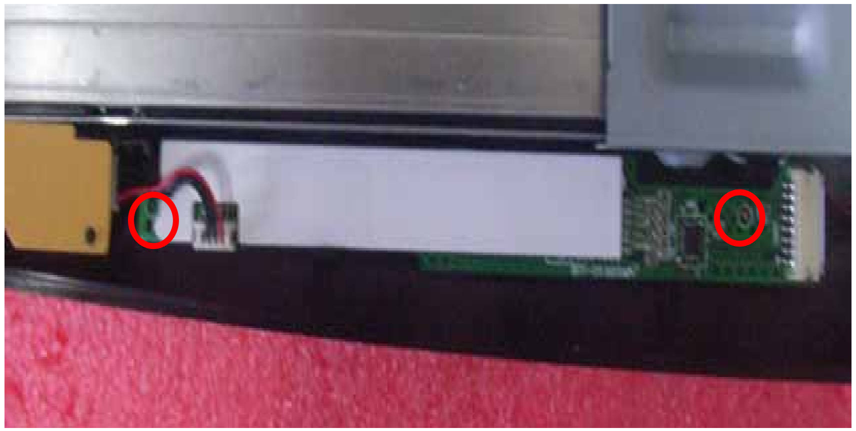
S10: Fix the chassis in the bezel.



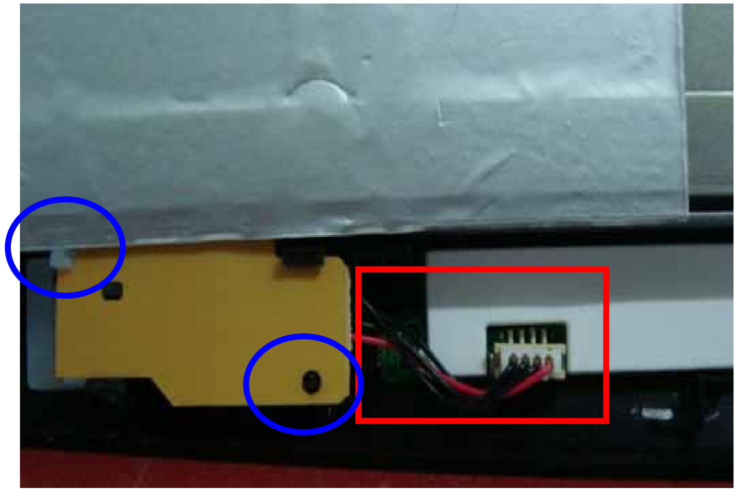
S11: Set up the speaker.



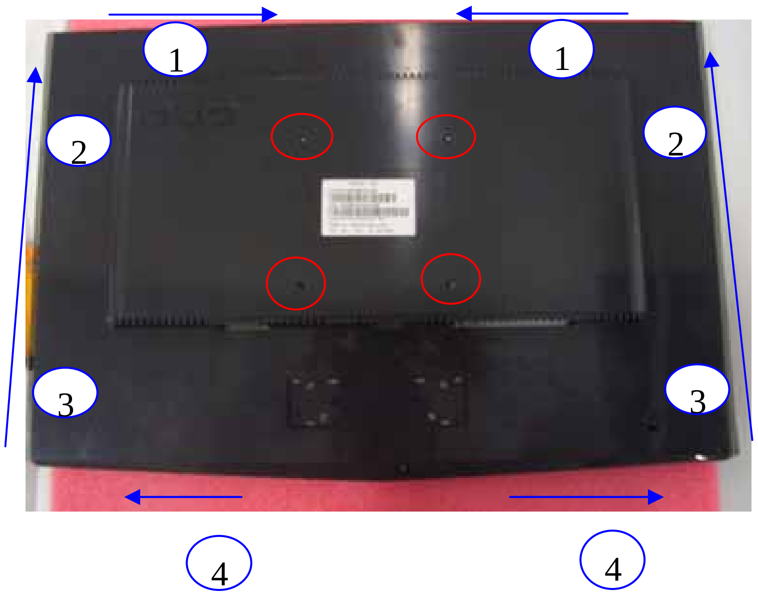
S12: Set up the keypad board and the touchpad board.



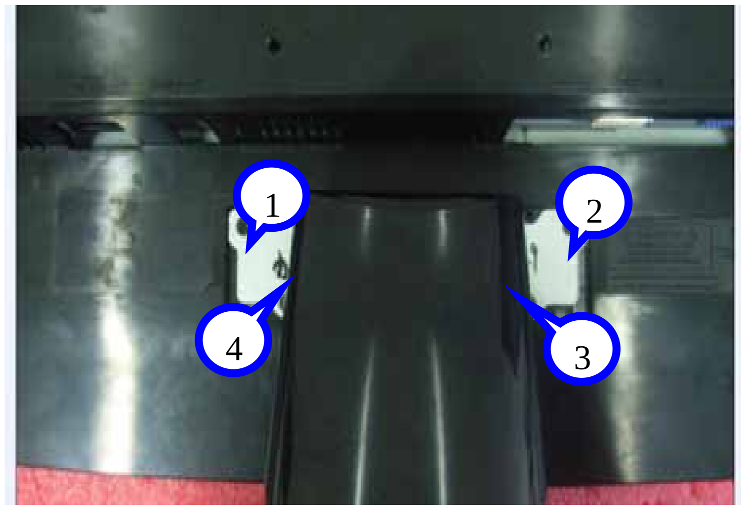
S13: Fix the touchpad board and the keypad board. Connect the two board



S14: Assemble the back cover.



S15: Assemble the stand and fix it.



S16: Assemble the left and right hinge cover.



S17: Assemble the base with the stand.

